Digitized by the Internet Archive
in 2025

https://archive.org/details/bwb_S0-EBS-247

VIEW OF THE AMERICAN FALL
Taken from Goat Island
Painted and engraved by W. J. Bennett (1831?)

ANTHOLOGY AND BIBLIOGRAPHY
OF
NIAGARA FALLS

BY

CHARLES MASON DOW, LL.D.

Former Commissioner of the State Reservation at Niagara

VOLUME II

PUBLISHED BY THE STATE OF NEW YORK
J. B. LYON COMPANY, PRINTERS
ALBANY
1921

CHAPTER VIII

CHAPTER VIII

MUSIC — POETRY — FICTION

1604

LA FRANCHISE, DE. Le Sievr de la Franchise av discovrs Dv Sievr Champlain. (*In* Champlain, Samuel de. Des sauvages . . . Paris, 1604.) 1604 La Franchise

It is an interesting fact that the first book printed in Europe which contains a reference to Niagara Falls, should also contain this sonnet in which allusion is made to the Falls. The sonnet follows the dedication. The old spelling of the original is followed in the quotation. Research has not revealed any information regarding the author.

Mvses, si vous chantez, vrayment ie vous conseille
Que vous louëz Champlain, pour estre courageux:
Sans crainte des hasards, il a veu tant de lieux,
Que ses relations nous contentment l'oreille.
Il a veu le Perou, Mexique et la Merueille
Du Vulcan infernal qui vomit tant de feux,
Et les saults Mocosans, qui offensent les yeux
De ceux qui osent voir leur cheute nonpareille.
Il nous promet encor de passer plus auant,
Reduire les Gentils, et trouuer le Leuant,
Par le Nort, ou le Su, pour aller à la Chine.
C'est charitablement tout pour l'amour de Dieu.
Fy des lasches poltrons qui ne bougent d'vn lieu!
Leur vie, sans mentir, me paroist trop mesquine.

1738

LE BEAU, C. Avantures du Sr. C. Le Beau. . . . ou voyage curieux et nouveau, parmi les sauvages de l'Amerique Septentrionale. Dans le quel on trouvera une description du Canada. Amsterdam: Wytwerf. 1738. P. 348–357. 1738 Le Beau

1738
Le Beau

"La Chute supremante de ce Saut est, me dirent mes *Canadians*, de plus de six-cens pieds perpendiculaires; La Facade a cent vingt toises de large. Elle est composee de deux grandes Nappes d'eau de deux Cascades, avec un Rocher on Ile entalus au milieu. Les eaux qui tombent de cette grande hauteur, ecument et bouillonment de la maniere du monde la plus terrible. Elles font un bruit si epouvantable, qu'il est impossible de s'entendre parlor quand on en est bien proche. Forsque le vent souffle au Sud on entend ce bruissement effroyable a plus de dis-huit lienes loin."

A romantic story of adventure under the guise of description and travel. According to his own statement, the author came to Canada in 1729. He made his home with the Recollect Fathers in Quebec for a time, then with two Indians went to the woods in search of adventures. He sets the time of his visit to Niagara in June, 1731. It is more than probable that he really did visit Canada, and possibly Niagara, but it is equally certain, that when he came to write the story of his travels, romance ran away with fact.

1764

1764
Goldsmith

GOLDSMITH, OLIVER. The traveller, or a prospect of society. (*In his* Poetical works. Bost.: Houghton, Mifflin and Co. N. d. P. 24. [British poets.])

During the French and Indian wars, Niagara was the farthest point of English dominion in the New World, generally known in the Old. This accounts for the allusion which we find in this poem of Goldsmith's.

Have we not seen, at pleasure's lordly call,
The smiling, long-frequented village fall?
Beheld the duteous son, the sire decay'd,
The modest matron, and the blushing maid,
Forc'd from their homes, a melancholy train,
To traverse climes beyond the western main;
Where wild Oswego spreads her swamps around
And Niagara stuns with thundering sound?
Even now, perhaps, as there some pilgrim strays
Thro' tangled forests, and thro' dangerous ways;
Where beasts with man divided empire claim,

And the brown Indian marks with murderous aim; 1764 Goldsmith
There, while above the giddy tempest flies,
And all around distressful yells arise,
The pensive exile, bending with his woe,
To stop too fearful, and too faint to go,
Casts a long look where England's glories shine,
And bids his bosom sympathize with mine.

1767

BILLARDON DE SAUVIGNY, EDME LOUIS. Hirza, ou Les Illinois, tragédie. Représentèe, pour la première fois, par les comediens ordinaires du Roi, le mercredi 27 Mai 1767. Paris: Le veuve Duchesne. 1780. Pp. 3–4. 1767 Billardon de Sauvigny

This French tragedy is a story of love and revenge with Niagara as a background.

ACTE PREMIER

On voit dans l'enfoncement le Saut di Niagara. D'un côté, des rochers, des cabinnes et quelques arbres; de l'autre, un tombeau eleve sur des piliers *matache*s et décoré de chevelures en forme de trophée; an pied du tombeau est Défunt, ses flèches, son casse-tête et son manitou. Hiaskar est appuyé et paroit consterné; les autres Guerriers, le Conseil des Vieillards, Oukea et plusieurs Femmes sauvages sont *épars* ca et la' dans des attitudes de douleur et de désespoir; Hirza est au milieu. Elle regarde le tombeau de son pere, et laisse voir plus de colere que d'abbatement.

SCENE PREMIERE

Haskar, Hirza, Oukea Vieillards, Guerriers Femmes Sauvages

Haskar

Sur ta tombe, Ô Thomar, les Illinois gémissent!
Ces huttes, ces rochers de leurs *cris* retentissent!
Et nos Dieux sont par nous vainment implorés!
Ils ont vu les François de ton sang enivrés,
Sans pouvoir t'arracher à leur glave homicide!

1767
Billardon de Sauvigny

Appui du Canada, notre Chef intrépide,
Aussi prompt que les vents, eût fait voler la mort
Des ramparts de Quebec aux monts du Labrador.
C'est du sang des François qu'il cimentoit sa gloire;
Et le nom de Thamar vivra dans leur mémoire.
Triste Niagara, sejour *crant* de nos Dieux,
Vous, rochers menacans, et vous flots furieux,
Qui des monts inégaux couvrant les vastes cimes,
Tombez en mugissant d'abîmes en abîmes,
Vous avez vu briser le calumet de paix,
Par un monstre animé sous la main des François.
Un vaisseau qui des flots s'elevant jusqu'aux nues
Agitoit dans les airs ses aîles entedues,
De longs tubes d'airain qu'il portoit dans ses flancs
Trappoient d'un bruit affreux les monts retentissans;
Sous tes pieds, Ô Thamar, tu sens trembler la terre;
Tu cours, la flamme en main, defiant le tonnerre,
Abimer dans les eaux ce colosse odieux,
Qui de son poids enorme eut accable des lieux.
Nous étions sous ta garde, á l'abri des tempêtes:
La hache des François vient de frapper nos têtes.
Pleurons, amis, pleurons, notre soutien n'est *plue;*
L'Europe est triomphante et nos Dieux sont vaincus.

1801

1801
Chateaubriand

CHATEAUBRIAND, FRANÇOIS AUGUSTE RENE, *vicomte de.* Atala; ou, Les amours de deux sauvages dans le désert. Paris: Impr. de Migneret, an IX–1801.

Chateaubriand considered himself the founder of the French romantic school. *Atala* is a fruit of his travels in America in 1791. Recent investigators have cast considerable doubt on the authenticity of many of his descriptions of America, but it seems reasonably certain that he did visit Niagara, even if he did not travel as widely through the country as he claimed to have done. He embodied with his own, descriptions and observations of other travellers.

1802

CHAUTEAUBRIAND, FRANÇOIS AUGUSTE RENE, *vicomte de.* Atala; or, The amours of two Indians in the wilds of America. Lond.: For J. Lee. 1802. Pp. 120–121. 1802 Chateaubriand

1804

MOORE, THOMAS. To the honourable W. R. Spencer. (*In his* Poetical works. N. Y.: D. Appleton and Co. 10 vols. 1853. 2:313–319.) 1804 Moore

Written from Buffalo and containing in its last lines an allusion to Niagara.

> Even now, as, wandering upon Erie's shore,
> I hear Niagara's distant cataract roar,
> I sigh for home,—

MOORE, THOMAS. To the Lady Charlotte Rawdon. (*In his* Poetical works. N. Y.: D. Appleton and Co. 10 vols. 1853. 2:325–335.)

This poem, written from the banks of the St. Lawrence in an epistle to Lady Charlotte Rawdon, contains two beautiful Niagara passages which are quoted below. In the second one, The Song of the Spirit, Moore describes Niagara in winter, as told to him, wandering on the brink of the Falls by an Indian spirit of the past.

> I dreamt not then that, ere the rolling year
> Had filled its circle, I should wander here
> In musing awe; should tread this wondrous world,
> See all its store of inland waters hurl'd
> In one vast volume down Niagara's steep;
> Or calm behold them, in transparent sleep,
> Where the blue hills of old Toronto shed
> Their evening shadows o'er Ontario's bed;
>
> . . . . .
>
> Oft, when hoar and silvery flakes
> Melt along the ruffled lakes,
> When the gray moose sheds his horns,
> When the track, at evening, warns
> Weary hunters of the way
> To the wigwam's cheering ray,

1804
Moore

Then, aloft through freezing air,
With the snow-bird soft and fair
As the fleece that heaven flings
O'er his little pearly wings,
Light above the rocks I play,
Where Niagara's starry spray,
Frozen on the cliff, appears
Like a giant's starting tears.
There, amid the island-sedge,
Just upon the cataract's edge,
Where the foot of living man
Never trod since time began,
Lone I sit, at close of day,
While, beneath the golden ray,
Icy columns gleam below,
Feathered round with falling snow,
And an arch of glory springs,
Sparkling as the chain of rings
Round the neck of virgins hung,—
Virgins, who have wandered young
O'er the waters of the west
To the land where spirits rest!

1804
Wilson

WILSON, ALEXANDER. The foresters: a poem, descriptive of a pedestrian journey to the Falls of Niagara, in the autumn of 1804, by the author of the *American ornithology*. Pub. by Samuel Tomlinson, Bucks County, Pa., Phila.: John Boyle. 1853. Pp. 71–78.

A narrative poem describing a journey from the banks of the Schuylkill, through Pennsylvania and New York to Niagara Falls, published in the Portfolio of Philadelphia in 1809 and 1810. The pages indicated are a description of the sound, vapor and of the Falls themselves from above, below and behind. The following lines show that Wilson's fame rests more securely on an ornithological rather than on a poetical basis.

Heavy and slow, increasing on the ear,
Deep through the woods a rising storm we hear,
Th' approaching gust still loud and louder grows,

As when the strong north-east resistless blows, 1804 Wilson
Or black tornado, rushing through the wood,
Alarms th' affrighted swains with uproar rude.
Yet the blue heavens displayed their clearest sky,
And dead below the silent forests lie;
And not a breath the slightest leaf assailed;
But all around tranquility prevailed.
" What noise is that? " we ask with anxious mien,
A dull salt driver passing with his team;
" Noise! Noise! — why nothing that I hear or see,
But Niagara falls — Pray, whereabouts live ye? ' "

(WILSON, ALEXANDER.) The foresters; a poem, descriptive of a pedestrian journey to the Falls of Niagara, in the autumn of 1803. By the author of the *American ornithology*. The Portfolio. March, 1810. 3:182–187.

1809

BARLOW, JOOL. The Columbiad. Lond.: 1809. P. 29. 1809 Barlow
Six lines of poor poetry descriptive of the Falls and the rainbows.

1818

NEAL, JOHN. (O'Cataract, Jehu.) Battle of Niagara, a poem, without notes, and Goldau, or the maniac harper. Baltimore: N. G. Maxwell. 1818. Pp. 67, 72–73. 1818 Neal

John Neal was of Quaker descent but was read out of the society. He was a pioneer in American literature, being the first American contributor to English and Scotch quarterlies. He was an artist, a lawyer, traveler, journalist, athlete, and an advocate of woman suffrage in 1838.

" The Battle of Niagara " was written when the author was a prisoner, so he informs the reader. It has a metrical introduction with four cantos which tell the story of the Battle of Niagara. This story is interspersed with various flights of poetic fancy on the scenery and surroundings of the Falls.

Niagara! Niagara! I hear
Thy tumbling waters. And I see thee rear
Thy thundering sceptre to the clouded skies:
I see it wave — I hear the ocean rise,

1818
Neal

And roll obedient to thy call. I hear
The tempest-hymning of thy floods in fear:
The quaking mountains and the nodding trees —
The reeling birds and the careering breeze —
The tottering hills, unsteadied in thy roar:
Niagara! as thy dark waters pour,
One everlasting earthquake rocks thy lofty shore!

. . . . .

The cavalcade went by. The day hath gone;
And yet the soldier lives: his cheerful tone
Rises in boisterous song; while slowly calls
The monarch spirit of the mighty falls.
Soldiers be firm! — and mind your watch fires well:
Sleep not to-night! — there comes a distant swell
Like the approaching step of toiling steeds
Encountering on the hills; and far behind us speeds,
Low stooping from his arch, the glorious sun
Hath left the storm with which his course begun;
And now, in rolling clouds goes calmly home
In heavenly pomp a-down the far blue dome.
In sweet toned minstrelsy is heard the cry,
All clear and smooth, along the echoing sky,
Of many a fresh blown bugle, full and strong,
The soldier's instrument! the soldier's song!
Niagara too, is heard: his thunder comes
Like far-off battle — hosts of rolling drums.
All o'er the western heaven the flaming clouds
Detach themselves and float like hovering shrouds:
Loosely unwoven, and afar unfurled,
A sunset canopy enwraps the world.
The Vesper hymn grows soft. In parting day
Wings flit about. The warblings die away,
The shores are dizzy, and the hills look dim,
The cataract falls deeper and the landscapes swim.

[Review of "The battle of Niagara, a poem without notes, and Goldau, or the maniac harper."] (N. Am. rev., Dec., 1818. 8:142–149.) 1818

According to the reviewer, the description is "of a singular character, as it is rather telling what things are like, than what they are."

1819

WAKEFIELD, PRISCILLA. Excursions in North America, described in letters from a gentleman and his young companion, to their friends in England. 3d ed. Lond.: Darton, Harvey and Darton. 1819. Pp. 260–275. 1819 Wakefield

Interesting for their account of the travel and living conditions of the period. There is a strongly adjective description of the view from Table Rock and from below the Falls. Hunting trips in the neighborhood with the Indians are also described.

1822

M. A. Niagara: a poem. N. Y.: Seymour, 1822. 1822 M. A.

A long poem in stilted style on the grandeur of the Falls, various features of the scenery, and the superiority of the Niagara to other rivers.

1823

BROWN, J. NEWTON. The Falls of Niagara. (*In his* Emily, and other poems. Concord: Boyd. 1840. Pp. 126–129.) 1823 Brown

Lofty in tone and well-sustained, consisting of description of, and reflections inspired by, Niagara. Written in Buffalo, July 6, 1823, and addressed to a friend.

1824

Travels in North America. Dublin: Brett Smith. 1824. Pp. 122–125. 1824

An imaginary tale of a young Irishman who visits the Falls and goes to Goat Island by canoe down the center of the river from Chippewa. The description of the Falls is brief, and includes an absurd sketch of the American Fall.

1825

(ALEXANDER, J. S.) Wonders of the west, of a day at the Falls of Niagara, in 1825. A poem, by a Canadian. N. Y.: 1825. 1825 Alexander

A poem of little merit, in which the descriptions of the scenery at Niagara are entirely subordinate to a romantic story told in verse.

1826

1826 Brainard

BRAINARD, JOHN GARDINER CALKINS. Poems . . . Hartford: Edward Hopkins. 1842. P. 10.

The editor of Littell's Living Age in 1874, pronounced this the finest poem ever written on Niagara, and strange to say, the author, who was the editor of the Connecticut Mirror from 1822 to 1827, never saw the cataract. It is said that one day while the printer's devil was calling for copy, Brainard was admiring a picture of Niagara. Its inspiration was on him, and he told the boy to return in fifteen minutes. Within this time he dashed off these nineteen lines which made him famous.

The thoughts are strange that crowd into my brain,
While I look upward to thee. It would seem
As if God poured thee from his " hollow hand,"
And hung his bow upon thine awful front;
And spoke in that loud voice, which seemed to him
Who dwelt in Patmos for his Saviour's sake,
" The sound of many waters; " and had bade
Thy flood to chronicle the ages back,
And notch His cent'ries in the eternal rocks.

Deep calleth unto deep. And what are we
That hear the question of that voice sublime?
O! what are all the notes that ever rung
From war's vain trumpet, by thy thundering side!
Yea, what is all the riot man can make
In his short life, to thy unceasing roar!
And yet, bold babbler, what art thou to Him,
Who drowned a world, and heaped the waters far
Above its loftiest mountains? — A light wave,
That breaks, and whispers of its Maker's might.

BRAINARD, JOHN GARDINER CALKINS. Niagara. (*In* Church, F. E., The great fall, Niagara. N. Y.: 1857. P. 3.)

1826 Emmons

EMMONS, RICHARD. The Fredoniad or independence preserved; an epic poem on the late War of 1812. Bost.: William Emmons. 1827. 3 vols. *Also* 2d ed., Phila.: William Emmons. 1830. 1 vol.

A poem in forty cantos dealing with the events of the War of 1812.

Some of the scenes are laid on the shores of the Niagara, at Lewiston, and on the heights of Queenston, and contain allusions to the cataract. 1826 Emmons

1828

PARK, *Rev.* ROSWELL. Niagara Falls. (*In his* Selections of juvenile and miscellaneous poems. Phila.: Desilver, Thomas. 1836. Pp. 70–73.) 1828 Park

PARK, *Rev.* ROSWELL. Niagara Falls. (*In his* Jerusalem; and other poems, juvenile and miscellaneous. . . . N. Y.: Stanford. 1857. Pp. 172–175.)

Written in 1828 in remembrance of a visit made to Niagara in the preceding year. The author describes the river and rapids and relates the tale of an Indian carried over the Falls while fishing.

1830

DUNLAP, WILLIAM. A trip to Niagara; or, Travellers in America. A farce in three acts. Written for the Bowery Theatre, New York. N. Y.: E. B. Clayton. 1830. 1830 Dunlap

The story of this play is mostly concerned with the incidents of the trip from New York to Niagara Falls. The characters are a disagreeable, disgruntled Englishman, his amiable and well-pleased sister and a cousin, a suitor of the sister, who undertakes to cure the brother of his rudeness. He assumes different characters in his efforts to do this. The last scene of the farce has Niagara Falls as a background.

HERECLIA, JOSE MARIA. Address to the Niagara river. (*In* Barham, William, Descriptions of Niagara; selected from various travellers. . . . Gravesend. N. d. Pp. 174–175.) 1830 Hereclia

This poem may also be found in Johnson, R. L., *Niagara, its history, incidents and poetry*, pp. 48–49. The author was a Spanish-American poet and soldier born in Cuba in 1803 and died in Mexico in 1839. He was considered the greatest of Spanish-American poets.

Tremendous Torrent! for an instant hush
The terrors of thy voice, and cast aside
Those wide-involving shadows; that mine eyes
May see the fearful beauty of thy face.

. . . . .

1830
Hereclia

Thou flowest on in quiet, till thy waves
Grow broken midst the rocks; thy current, then,
Shoots onward, like the irresistible course
Of destiny. How terribly they rage,—
The hoarse and rapid whirlpools there! My brain
Grows wild, my senses wander, as I gaze
Upon the hurrying waters; and my sight
Vainly would follow, as toward the verge
Sweeps the wide torrent: waves innumerable
Meet there and madden; waves innumerable
Urge on and overtake the waves before,
And disappear in thunder and in foam.
They reach, they leap, the barrier; the abyss
Swallows, insatiable, the sinking waves;
A thousand rainbows arch them, and the woods
Are deafen'd with the roar. The violent shock
Shatters to vapour the descending sheets;
A cloudy whirlwind fills the gulf, and bears
The mighty pyramid of circling mist
To heaven. The solitary hunter, near,
Pauses with terror, in the forest shade.
God of all truth! in other lands, I've seen
Lying philosophers, blaspheming men,
Questioners of thy mysteries, that draw
Their fellows deep into impiety;
And therefore doth my spirit seek thy face
In earth's majestic solitude. Even here
My heart doth open all itself to Thee;
In this immensity of loneliness,
I feel thy hand upon me. To my ear
The eternal thunder of the cataract brings
Thy voice, and I am humbled as I hear.
Dread torrent! that with wonder and with fear,
Dost overwhelm the soul of him that looks
Upon thee, and dost bear it from itself:

Whence hast thou thy beginning? Who supplies, 1830
Age after age, thy unexhausted springs? Heredia
What power hath order'd, that, when all thy weight
Descends into the deep, the swollen waves
Rise not, and roll to overwhelm the earth?
The Lord hath open'd his omnipotent hand,
Covered thy face with clouds, and given his voice
To thy down-rushing waters; he hath girt
Thy terrible forehead with his radiant bow.
I see thy never-resting waters run,
And I bethink me how the tide of time
Sweeps to Eternity. So pass, of man—
Pass like a noon-day dream—the blooming days,
And he awakes to sorrow. . . .
Hear, dread Niagara! my latest voice!—
Yet a few years, and the cold earth shall close
Over the brow of him who sings thee now
Thus failingly. Would that this my humble verse
Might be, like thee, immortal! I, meanwhile,
Cheerfully passing to the appointed rest,
Might raise my radiant forehead in the clouds
To listen to the echoes of my FAME."

1831

COOPER, JAMES FENIMORE. The spy; a tale of the neutral ground. 1831
. . . Lond.: H. Colburn and R. Bentley. 1831. P. 403 Cooper

Niagara is used as the background of the closing scene in the story.

GALT, JOHN. The early missionaries; or, The discoveries of the Falls 1831
of Niagara. (The museum of for. lit. and sci., Oct., 1831. 19: Galt
(new ser. 12) 397–400.)

A history of two missionaries who travelled westward from Boston to christianize the Indians and to find the vast fresh-water seas of which they had heard the Indians speak. In the course of their travels they come upon the Falls. There is no attempt at description. It is not apparent that the tale has any historical basis.

1832

1832
A. N. C.

A. N. C. Poem. (*In* Rolph, Thomas, A brief account together with observations, made during a visit in the West Indies, and a tour through the United States of America, in parts of the years 1832–33; together with a statistical account of Upper Canada. Dundas, N. C. Hackstaff, 1836. P. 196.)

Niagara! to thee
My spectacles I turn!
I see the waters boil,
As if all . . . did burn,
And Satan's imps, with ardour hot,
Were thrusting wood beneath the pot.

O what a deaf'ning noise
Thy tortur'd waters make!
The thunders of thy voice
Kept me all night awake:
I could but hear the lumbering sound,
When all were sunk in sleep profound.

And then what clouds of spray
Bedim my weaken'd sight;
And then, in light of day,
Bring rainbows to my sight:
Well might poor Snip thus make his note —
"*Mem*—What a place to spunge a coat!"

And then, O what a waste
Of water-power is here!
'Twould move ten thousand water-wheels,
And run them thro' the year!
Well might the Yankee say — "be still —
Oh what a place to build a mill."

1834

SIGOURNEY, *Mrs.* LYDIA H. Farewell to Niagara. (In Barham, William, Descriptions of Niagara; selected from various travellers. . . . Gravesend: n. d. Pp. 179–180.)

My spirit grieves to say, Farewell to thee,
Oh beautiful and glorious!
Thou dost robe
Thyself in mantle of the coloured mist,
Most lightly tinged, and exquisite as thought,
Decking thy forehead with a crown of gems
Woven by God's right hand.
Hadst thou but wrapped
Thy brow in clouds, and swept the blinding mist
In showers upon us, it had been less hard
To part from thee. But there thou art, sublime
In noon-day splendour, gathering all thy rays
Unto their climax, green, and fleecy white,
And changeful tincture, for which words of man
Have neither sign nor sound, until to breathe
Farewell is agony. For we have roamed
Beside thee, at our will, and drawn thy voice
Into our secret soul, and felt how good
Thus to be here, until we half implored,
While long in wildering ecstasy we gazed,
To build us tabernacles, and behold
Always thy majesty.
Fain would we dwell
Here at thy feet, and be thy worshipper,
And from the weariness and dust of earth
Steal evermore away. Yea, were it not
That many a care doth bind us here below,
And in each care, a duty, like a flower,
Thorn-hedged, perchance, yet fed with dews of heaven,
And in each duty, an enclosed joy,
Which like a honey-searching bee doth sing,—

1834
Sigourney

And were it not, that ever in our path
Spring up our planted seeds of love and grief,
Which we must watch, and bring their perfect fruit
Into our Master's garner, it were sweet
To linger here, and be thy worshipper,
Until death's footsteps broke this dream of life.

SIGOURNEY, L. H. The hermit of the Falls. (*In her* Illustrated poems. Phila.: Lindsay and Blakiston. 1860. Pp. 143–149)

The story of Francis Abbott.

SIGOURNEY, *Mrs.* LYDIA H. The hermit of Niagara. (Graham's Am. mo. mag., Feb., 1848. 32:127–128.)

SIGOURNEY, *Mrs.* LYDIA H. The hermit of the Falls. (*In* Barham, William, Descriptions of Niagara; selected from various travellers; . . . Gravesend: n. d. Pp. 142–146.)

It was the leafy month of June,
And joyous nature all in tune,
With wreathing buds were drest,
As towards Niagara's fearful side
A youthful stranger prest;
His ruddy cheek was blanched with awe,
And scarce he seemed his breath to draw,
While bending o'er its brim,
He marked its strong, unfathomed tide,
And heard its thunder-hymn.

His measured week too quickly fled,
Another, and another sped,
And soon the summer-rose decayed,
The moon of autumn sank in shade,
Years filled their circle, brief and fair,
Yet still the enthusiast lingered there,
Till winter hurled its dart,
For deeper round his soul was wove
A mystic chain of quenchless love,
That would not let him part

1834
Sigourney

When darkest midnight veiled the sky,
You'd hear his hasting step go by,
To gain the bridge, beside the deep,
That where its wildest torrents leap
Hung threadlike o'er the surge,
Just there, upon its awful verge,
His vigil hour to keep.

And when the moon descending low,
Hung on the flood that gleaming bow,
Which it would seem some angel's hand,
With heaven's own pencil, tinged and spanned,
Pure symbol of a Better Land,
He, kneeling, poured in utterance free
The eloquence of ecstasy;
Though to his words no answer came,
Save that One, Everlasting Name,
Which since Creation's morning broke,
Niagara's lip alone hath spoke.

When wintry tempests shook the sky,
And the rent pine-tree hurtled by,
Unblenching mid the storm he stood,
And marked, sublime, the wrathful flood,
While wrought the frost-king fierce and drear,
His palace mid those cliffs to rear,
And strike the massy buttress strong,
And pile his sleet the rocks among,
And wasteful deck the branches bare
With icy diamonds, rich and rare.

Nor lacked the hermit's humble shed
Such comforts as our nature ask
To fit them for their daily task,
The cheering fire, the peaceful bed,
The simple meal in season spread:—

1834
Sigourney

While by the lone lamp's trembling light,
As blazed the hearth-stone clear and bright,
O'er Homer's page he hung,
Or Maro's martial numbers scanned,
For classic lore of many a land
Flowed smoothly o'er his tongue.
Oft with rapt eye, and skill profound,
He woke the entrancing viol's sound,
Or touched the sweet guitar,
Since heavenly music deigned to dwell
An inmate in his cloistered cell,
As beams the solemn star
All night, with meditative eyes,
Where some lone rock-bound fountain lies.

As through the groves with quiet tread,
On his accustomed haunts he sped,
The mother-thrush unstartled sung
Her descant to her callow young,
And fearless o'er his threshold prest
The wanderer from the sparrow's nest;
The squirrel raised a sparkling eye,
Nor from his kernel cared to fly,
As passed that gentle hermit by;
No timid creature shrank to meet
His pensive glance serenely sweet;
From his own kind, alone, he sought
The screen of solitary thought.
Whether the world too harshly prest,
Its iron o'er a yielding breast,
Or taught his morbid youth to prove
The pang of unrequited love,
We know not, for he never said
Aught of the life that erst he led.

On Iris isle, a summer bower
He twined with branch, and vine, and flower,
And there he mused, on rustic seat,
Unconscious of the noon-day heat,
Or 'neath the crystal waters lay
Luxuriant, in the swimmer's play.
Yet once the whelming flood grew strong,
And bore him like a weed along,
Though with convulsive grasp of pain,
And heaving breast, he strove in vain,
Then sinking 'neath the infuriate tide,
Lone as he lived, the hermit died.

1834
Sigourney

On, by the rushing current swept,
The lifeless corpse its voyage kept,
To where, in narrow gorge comprest,
The whirling eddies never rest,
But boil with tumultuous sway.
The maelstrom of Niagara.
And there within that rocky bound,
In swift gyrations round and round,
Mysterious course it held,
Now springing from the torrent hoarse,
Now battling as with maniac force,
To mortal strife compelled.

Right fearful 'neath the moonbeam bright,
It was to see that brow so white,
And mark the ghastly dead
Leap upward from his torture-bed,
As if in passion-gust,
And tossing wild with agony,
To mock the omnipotent decree,
Of dust to dust.

At length, where smoother waters flow,
Emerging from the gulf below,

1834
Sigourney

The hapless youth they gained, and bore
Sad to his own forsaken door:
There watched his dog, with straining eye,
And scarce would let the train pass by,
Save that with instinct's rushing spell,
Through the changed cheek's empurpled hue,
And stiff and stony form, he knew
The master he had loved so well.
The kitten fair, whose graceful wile
So oft had won his musing smile,
As round his slippered foot she played,
Stretched on his vacant pillow laid.
While strewed around, on board and chair,
The last pluck'd flower, the book last read,
The ready pen, the page outspread,
The water-cruse, the unbroken bread,
Revealed how sudden was the snare
That swept him to the dead.

And so he rests in foreign earth,
Who drew mid Albion's vales his birth;
Yet let no cynic phrase unkind
Condemn that youth of gentle mind,
Of shrinking nerve and lonely heart,
And lettered lore, and tuneful art,
Who here his humble worship paid
In that most glorious temple-shrine,
Where to the Majesty divine
Nature her noblest altar made.

No, blame him not, but praise the Power
Who in the dear, domestic bower,
Hath given you firmer strength to rear
The plant of love, with toil and fear,
The beam to meet, the blast to dare,
And like a faithful soldier bear;

Still with sad heart his requiem pour, 1834
Amid the cataract's ceaseless roar, Sigourney
And bid one tear of pitying gloom
Bedew that meek enthusiast's tomb.

SIGOURNEY, *Mrs.* LYDIA H. Niagara. (*In* Barham, William, Descriptions of Niagara; selected from various travellers; . . . Gravesend: n. d. Pp. 111–117.)

Prose and poem description of the Falls.

Up to the Table-Rock, where the great flood
Reveals its fullest glory. To the verge
Of its appalling battlement draw near,
And gaze below. Or, if thy spirit fail,
Creep stealthily, and snatch a trembling glance
Into the dread abyss.
What there thou seest
Shall dwell forever in thy secret soul,
Finding no form of language.
The vexed deep,
Which from the hour that Chaos heard the voice
" Let there be light," hath known no pause nor rest,
Communeth through its misty cloud with Him
Who breaks it on the wheel of pitiless rock,
Yet heals it every moment. Bending near,
Mid all the terror, as an angel-friend,
The rainbow walketh in its company
With perfect orb full-rounded. Dost thou cling
Thus to its breast, a Comforter, to give
Strength in its agony, thou radiant form,
Born of the trembling tear-drop, and the smile
Of sun, or glimmering moon?
Yet from a scene
So awfully sublime, our senses shrink,
And fain would shield them at the solemn base
Of the tremendous precipice, and glean
Such hallowed thoughts as blossom in its shade.

1834
Sigourney

This is thy building, Architect Divine!
Who heav'dst the pillars of the Universe.
Up, without noise, the mighty fabric rose,
And to the clamour of the unresting gulf
For ever smiting on its ear of rock
With an eternal question, answereth nought.
Man calls his vassals forth, with toil and pain;
Stone piled on stone, the pyramid ascends,
Yet ere it reach its apex-point, he dies,
Nor leaves a chiselled name upon his tomb.
The vast cathedral grows, with deep-groined arch,
And massy dome, slow reared, while race on race
Fall like the ivy sere, that climbs its walls.
The imperial palace towers, the triumph arch,
And the tall fane that tells a hero's praise
Uplift their crowns of fret-work haughtily.
But, lo! the Goth doth waste them, and his herds
The Vandal pastures mid their fallen pride.
But thou, from age to age, unchanged hast stood,
Even like an altar to Jehovah's name,
Silent, and stedfast, and immutable.
Niagara and the storm-cloud!
To the peal
Of their united thunder, rugged rocks
Amazed reverberate, through depths profound
Streams the red lightning, while the loftiest trees
Bow, and are troubled. Shuddering earth doth hide
In midnight's veil; and even the ethereal mind,
Which hath the seed of immortality
Within itself,— not undismayed, beholds
This fearful tumult of the elements.
Old Ocean meets the tempest and is wroth,
And in his wrath destroys. The wrecking ship,
The sea-boy stricken from the quaking mast,
The burning tear wrung forth from many a home,

To which the voyager returns no more,
Attest the fury of his vengeful mood.
But thou, Niagara, know'st no passion-gust;
Thy mighty bosom, from the sheeted rain,
Spreads not itself to sudden boastfulness,
Like the wild torrent in its shallow bed.
Thou art not angry, and thou changest not.

Man finds in thee no emblem of himself;
The cloud depresseth him, the adverse blast
Rouseth the billows of his discontent,
The wealth of summer-showers inflates his pride,
And with the simple faith and love of Him
Who made him from the dust, he mingleth much
Of his own vain device. Perchance, even here,
'Neath all the sternness of thy strong rebuke,
Light fancies fill him, and he gathereth straws
Or plaiteth rushes, or illusive twines
Garlands of hope, more fragile still than they.

But in one awful voice, that ne'er has known
Change or inflection since the morn of time,
Thou utterest forth that One Eternal Name,
Which he who graves not on his inmost soul
Will find his proudest gatherings, as the dross
That cannot profit.
Thou hast ne'er forgot
Thy lesson, or been weary, day or night,
Nor with its simple, elemental thought
Mixed aught of discord.
Teacher, sent from God,
We bow us to thy message, and are still.
Oh! full of glory, and of majesty,
With all thy terrible apparel on,
High-priest of Nature, who within the veil
Mysterious, unapproachable dost dwell,

1834
Sigourney

With smoke of incense ever streaming up,
And round thy breast, the folded bow of heaven,
Few are our words before thee.
For 'tis meet
That even the mightiest of our race should stand
Mute in thy presence, and with child-like awe,
Disrobed of self, adore his God through thee.

"Deep calleth unto deep, at the noise of thy waterspouts." Most appositely did the poet Brainerd, in his beautiful apostrophe to Niagara, quote from the inspired minstrel, "deep calleth unto deep." Simple and significant also, was its Indian appellation, the "Water-thunderer." To the wandering son of the forest,

"whose untutored mind
Saw God in clouds, or heard him in the wind,"

it forcibly suggested the image of that Great Spirit, who in darkness and storm sends forth from the skies a mighty voice.

The immense volume of water which distinguishes Niagara from all other cataracts, is seldom fully realized by the casual visitant. Transfixed by his emotions, he forgets that he sees the surplus waters of those vast inland seas, Superior, Huron, Michigan, and Erie, arrested in their rushing passage to the Ocean, by a fearful barrier of rock, 160 feet in height. He scarcely recollects that the tributaries to this river, or strait, cover a surface of 150,000 miles. Indeed, how can he bow his mind to aught of arithmetical computation, when in the presence of this monarch of floods.

The view from the boat while crossing the Ferry is unique and impressive. It gives the first strong idea of the greater magnificence that awaits you.* You are encompassed by an amphitheatre of towering rocks and hills. Fragments of rainbows and torrents of mist hover around you. A stupendous column rises, whose base is in the fathomless depth, whose head, wrapped in cloud, seems to join earth and heaven. It strikes you as a living personi-

* That is crossing from the American side.

fication of His power who poured it "from the hollow of his hand." You tremble at its feet. With a great voice of thunder it warns you not to approach. The winds spread out their wings, and whelm you in a deluge of spray. You are sensible of the giant force of the tide, bearing up the boat, which like an egg-shell is tossed upon its terrible bosom. You feel like an atom in the great creation of God. You glance at the athletic sinews of the rowers, and wonder if they are equal to their perilous task. But the majesty of the surrounding scene annihilates selfish apprehension; and, ere you are aware, the little boat runs smoothly to her haven, and you stand on the Canadian shore. 1834 Sigourney

Hitherto, all you have seen will convey but an imperfect impression of the grandeur and sublimity that are unfolded on the summit of Table-Rock. This is a precipice nearly 160 feet in height, with flat, smooth, altar-shaped surface. As you approach this unparapeted projection, the unveiled glories of Niagara burst upon the astonished senses. We borrow the graphic delineation of a gentleman,[1] who nearly forty years since was a visitant of this scene, and thus describes it from the summit of Table-Rock.

"On your right hand, the river comes roaring forward with all the agitation of a tempestuous ocean, recoiling in waves and whirlpools, as if determined to resist the impulse which is forcing it downward to the gulf. When within a few yards, and apparently at the moment of sweeping away, it plunges headlong into what seems a bottomless pit, for the vapour is so thick at the foot of the precipice, that the torrent is completely lost to view.

"Seen from the Table-Rock, the tumbling green waters of the rapids, which persuade you that an ocean is approaching; the brilliant colour of the water; the frightful gulf, and headlong torrent at your feet; the white column rising from its centre, and often reaching to the clouds; the black wall of rock frowning from the opposite island; and the long curtain of foam descending from the other shore, interrupted only by one dark shaft, form altogether one of the most beautiful, as well as awful, scenes in

[1] Dr. Wadsworth, Esq.

1834
Sigourney

nature. The effect of all these objects is much heightened by being seen from a dizzy and fearful pinnacle, upon which you seem suspended over a fathomless abyss of vapour, whence ascends the deafening uproar of the greatest cataract in the world, and by reflecting that this powerful torrent has been rushing down, and this grand scene of stormy magnificence been in the same dreadful tumult for ages, and will continue so for ages to come."

Skirting the base of the Table-Rock, you arrive at the point of entrance, behind the vast sheet of water, which those who desire to traverse, provide themselves with fitting apparel, which is here kept for that purpose. This magnificent cavern is often tenanted by rushing winds, which drive the spray with blinding fury in the face of the approaching pilgrim. Clad in rude garments, and cap of oil-cloth, with coarse shoes — the most unpicturesque of all figures — he approaches, staking his staff among the loose fragments that obstruct his way. The path is slippery and perilous, the round wet stones betray his footing, and sometimes cold, slimy, and wriggling eels coil around his ancles. Respiration is at first difficult, almost to suffocation. But the aiding hand and encouraging voice of the guide are put in requisition, and, almost ere he is aware, he reaches Termination Rock, beyond which all progress is hazardous. This exploit entitles him to a certificate, obtained at the house where his garb was provided, and signed by the guide. But should he fail of attaining this honour, by a too precipitate retreat from this cavern of thunders, he is still sure of a magnificent shower-bath.

The lover of Nature's magnificence will scarcely be satisfied without repeated visits to Niagara. The mind is slow in receiving the idea of great magnitude. It requires time and repetition to expand and deepen the perceptions that overwhelm it. This educating process is peculiarly necessary among scenery, where the mind is continually thrown back upon its Author, and the finite, trying to take hold of the Infinite, falters, and hides itself in its own nothingness.

1834 Sigourney

It is impossible for Niagara to disappoint, unless through the infirmity of the conception that fails to grasp it. Its resources are inexhaustible. It can never expand itself, because it points always to God. More unapproachable than the fathomless ocean, man cannot launch a bark upon its bosom, or bespeak its service in any form. He may not even lay his hand upon it, and live. Upon its borders he can dream, if he will, of gold-gathering, and of mill-privileges; but its perpetual warning is, "Hence, ye profane!"

Let none, who have it in their power to change their places at will, omit a pilgrimage to Niagara. The facilities of travelling render it now a very different exploit from what it was in the days of our fathers, who were forced to cut away with their axes the branches intercepting the passage of the rocky roads. Those whose hearts respond to whatever is beautiful and sublime in creation, should pay their homage to this mighty cataract. No other scenery so powerfully combines these elements.

Let the gay go thither to be made thoughtful, and the religious to become more spiritually-minded. Yet let not the determined trifler linger here to pursue his revels. Frivolity seems an insult to the majesty that presides here. Folly and dissipation are surely out of place. The thunder-hymn of the mighty flood reproves them. Day and night it seems to repeat and enforce the words of inspiration: "The Lord is in his holy temple: let all the earth keep silence before Him."— HAB. ii:20.

SIGOURNEY, *Mrs.* LYDIA H. Niagara. (*In* Barham, William, Descriptions of Niagara; selected from various travellers. . . . Gravesend: n. d. Pp. 159–161.)

SIGOURNEY, *Mrs.* L. H. Niagara. (*In her* Illustrated poems. Phila.: Lindsay and Blakiston. 1860. Pp. 134–136.)

Flow on for ever, in thy glorious robe
Of terror and of beauty. Yea, flow on
Unfathom'd and resistless. God hath set
His rainbow on thy forehead, and the cloud

1834
Sigourney

Mantled around thy feet. And he doth give
Thy voice of thunder power to speak of Him
Eternally — bidding the lip of man
Keep silence — and upon thine altar pour
Incense of awe-struck praise.
Earth fears to lift
The insect trump that tells her trifling joys
Or fleeting triumphs, mid the peal sublime
Of thy tremendous hymn. Proud Ocean shrinks
Back from thy brotherhood, and all his waves
Retire abash'd. For he hath need to sleep,
Sometimes, like a spent labourer, calling home
His boisterous billows, from their vexing play,
To a long dreary calm: but thy strong tide
Faints not, nor e'er with failing heart forgets
Its everlasting lesson, night nor day.
The morning stars, that hailed creation's birth,
Heard thy hoarse anthem mixing with their song
Jehovah's name; and the dissolving fires,
That wait the mandate of the day of doom
To wreck the earth, shall find it deep inscribed
Upon thy rocky scroll.
The lofty trees
That list thy teachings, scorn the lighter lore
Of the too fitful winds; while their young leaves
Gather fresh greenness from thy living spray,
Yet tremble at the baptism. Lo! yon birds,
How bold they venture near, dipping their wing
In all thy mist and foam. Perchance 'tis meet
For them to touch thy garment's hem, or stir
Thy diamond wreath, who sport upon the cloud
Unblamed, or warble at the gate of heaven
Without reproof. But, as for us, it seems
Scarce lawful with our erring lips to talk
Familiarly of thee. Methinks, to trace

View of the Old Cable "Trolley" over the Rapids

(The Falls appearing in the distance)

Thine awful features with our pencil's point 1834
Were but to press on Sinai. Sigourney
Thou dost speak
Alone of God, who pour'd thee as a drop
From his right-hand,— bidding the soul that looks
Upon thy fearful majesty be still,
Be humbly wrapp'd in its own nothingness,
And lose itself in Him.

SIGOURNEY, *Mrs.* L. H. Niagara. (*In her* Select poems. 5th ed. Phila.: Biddle. 1847. Pp. 88–90.)
See " Illustrated Poems."

1836

DRAKE, JOSEPH RODMAN. Niagara. (*In his* Culprit fay and other poems. N. Y.: George Dearborn. 1836. Pp. 65–67.) 1836 Drake

NIAGARA

I

Roar, raging torrent! and thou, mighty river,
Pour thy white foam on the valley below;
Frown, ye dark mountains! and shadow for ever
The deep rocky bed where the wild rapids flow.
The green sunny glade, and the smooth flowing fountain,
Brighten the home of the coward and slave;
The flood and the forest, the rock and the mountain,
Rear on their bosoms the free and the brave.

II

Nurslings of nature, I mark your bold bearing,
Pride in each aspect and strength in each form,
Hearts of warm impulse, and souls of high daring,
Born in the battle and rear'd in the storm.
The red levin flash and the thunder's dread rattle,
The rock-riven wave and the war trumpet's heath,
The din of the tempest, the yell of the battle,
Nerve your steeled bosoms to danger and death.

1836
Drake

III

High on the brow of the Alps' snowy towers
The mountain Swiss measures his rock-breasted moors,
O'er his lone cottage the avalanche lowers,
Round its rude portal the spring-torrent pours.
Sweet is his sleep amid peril and danger,
Warm is his greeting to kindred and friends,
Open his hand to the poor and the stranger,
Stern on his foeman his sabre descends.

IV

Lo! where the tempests the dark waters sunder
Slumbers the sailor boy, reckless and brave,
Warm'd by the lightning and lulled by the thunder,
Fann'd by the whirlwind and rock'd on the wave;
Wildly the winter wind howls round his pillow,
Cold on his bosom the spray showers fall;
Creaks the strained mast at the rush of the billow,
Peaceful he slumbers regardless of all.

V

Mark how the cheek of the warrior flushes,
As the battle drum beats and war torches glare;
Like a blast of the north to the onset he rushes,
And his wide-waving falchion gleams brightly in air.
Around him the death-shot of foemen are flying,
At his feet friends and comrades are yielding their breath;
He strikes to the groans of the wounded and dying,
But the war cry he strikes with is, ' conquest or death.'

VI

Then pour thy broad wave like a flood from the heavens,
Each son that thou rearest, in the battle's wild shock,
When the death-speaking note of the trumpet is given,

Will charge like thy torrent or stand like thy rock. 1836
Let his roof be the cloud and the rock be his pillow, Drake
Let him stride the rough mountain, or toss on the foam,
He will strike fast and well on the field or the billow,
In triumph and glory, for God and his home!

The note of freedom and patriotism in this poem rings strong and true.

[SHELTON, F. W.] Verses written during a thunder storm in the album at the Falls. (*In his* The trollopiad; or, Travelling gentlemen in America; a satire by Nil Admirari, Esq. N. Y.: Shepard 1836. Pp. 79–81.) 1836 Shelton

Written in the Table Rock album.

1837

BIRD, JAMES. Francis Abbot; the recluse of Niagara, and metropolitan sketches. 2d ser. Lond.: Baldwin and Cradock. 1837. Pp. 1–93. 1837 Bird

A narrative poem based on the facts as found in Alexander's *Transatlantic sketches* with variations by the author.

ELIZA. Niagara. (Soc. lit. miss., Jan. 1837. 3:21–22.) 1837 Eliza

The spirit of the torrent, the spirit of beauty, the spirit of solitude, the spirit of poesy, the spirit of devotion each in turn speaks.

1838

BUCKINGHAM, JAMES SILK. Hymn to Niagara. (*In* Barham, William, Descriptions of Niagara; selected from various travellers . . . Gravesend: n. d. Pp. 41–42.) 1838 Buckingham

(Written at the first sight of magnificent Falls, August, 1838.)

Hail! Sovereign of the World of Floods, whose majesty and might,
First dazzles — then enraptures — then o'erawes the aching sight;
The pomp of kings and emperors, in every clime and zone,
Grows dim before the splendour of thy glorious watery throne.

1838
Buckingham

No flesh can stop thy progress, no armies bid thee stay;
But onward — onward — onward — thy march still holds its way
The rising mist that veils thee as thine herald goes before,
And the music that proclaims thee is the thundering cataracts' roar.

Thy diadem is an emerald green, of the clearest, purest hue,
Set round with waves of snow-white foam, and spray of feathery dew;
White tresses of the brightest pearls float o'er thine ample sheet,
And the rainbow lays its gorgeous gems in tribute at thy feet.

Thy reign is of the ancient days, thy sceptre from on high,
Thy birth was when the morning stars together sang with joy:
The sun, the moon, and all the orbs that shine upon thee now,
Saw the first wreath of glory that enthron'd thy infant brow.

And from that hour to this, in which I gaze upon thy stream,
From age to age — in winter's frost, or summer's sultry beam —
By day, by night — without a pause — thy waves, with loud acclaim,
In ceaseless sounds, have still proclaimed the Great Eternal's name.

For whether on thy forest banks, the Indian of the wood,
Or since his days, the Red Man's foe, on his father-land have stood —
Whoe'er has seen thine incense rise, or heard thy torrent roar,
Must have bent before the God of All! to worship and adore.

Accept then, O Supremely Great! — O Infinite! — O God!
From this primeval altar — the green and virgin sod —
The humble homage that my soul in gratitude would pay
To Thee! whose shield has guarded me through all my wandering way.

For if the Ocean be as nought in the hollow of thy hand, 1838
And the Stars of the bright firmament, in thy balance grains of Buckingham
sand,
If Niagara's rolling flood seem great to us who lowly bow —
O! Great Creator of the Whole! how passing great art Thou!

Yet though Thy Power is greater than the finite mind can scan,
Still greater is thy Mercy — shown to weak dependent man,
For him Thou clothed the fertile field with herb, and fruit, and
seed,
For him, the woods, the lakes, the seas, supply his hourly need.

Around — on high — or far — or near — the Universal Whole
Proclaims Thy glory, as the orbs in their fixed courses roll;
And from Creation's grateful voice, the hymn ascends above,
While heaven re-echoes back to earth, the chorus, "God is Love."

BUCKINGHAM, JAMES SILK. Hymn to Niagara. (*In* Johnson, R. L., Niagara, its history, incidents, and poetry. . . . Wash.: W. Neale. 1898. Pp. 56–57.)

Evidently the same poem as the one quoted in *Barham*, although the phraseology of the two poems differs in a number of lines.

(The) Canadian girl, or the Pirate of the lakes, a story of the affec- 1838
tions; by the authoress of the *Jew's daughter*. Lond.: W. Bennett. 1838. Pp. 264–267.

An exaggerated, overdrawn and inaccurate scenic description of Niagara and the Niagara region.

RICHARDSON, *Major* JOHN. Eight years in Canada. Montreal: 1838
H. H. Cunningham. 1847. Pp. 22–25. Richardson

A description of the scenery, an account of the sensations and reflections of the author on revisiting his old home on the Niagara. Some statistics are also given and some remarks on the Table Rock album.

I had expected to see the mass of water tumbling, foaming, from something like a height, and threatening, at every moment, to enshroud the spectator in one huge sheet of prismatic spray, and to plunge him into the vortex which formed its bed; whereas on gaining the table rock I remarked, a few feet below me, a

1838 Richardson

large flat sheet of water, that gurgled, and hissed, and lashed itself into fury at its immediate point of descent, but which, as far as the eye could reach above presented an almost unbroken uniformity of surface. It is this want of irregularity added to the absence of corresponding scenery, that robs the Falls in my estimation of much of the imposing grandeur that otherwise attaches to them.

1839

1839 Grinfield

GRINFIELD, THOMAS. Hymn on Niagara. (*In* Barham William, Descriptions of Niagara; selected from various travellers; . . . Gravesend: n. d. Pp. 176–177.)

An anthem, 'like the sound of many waters!'
The prophet heard it, as in wondrous vision
He lay entranced upon the cliffs of PATMOS;
And wouldst thou hear its emblem, go and listen,
In deep and dread delight, to NIAGARA!
That everlasting anthem which hath peal'd
Nor paus'd a moment, from the birth of ages!
And, fitting emblem of celestial chorus,
The loud eternity of rushing music
Disturbs not, but subdues and fills, the spirit
With feelings of unutterable stillness,[1]
And infinite tranquillity, excluding
The world with all its dissonance of passions.
There, too, a cloud of ever-offer'd incense
From nature's altar, — in the vapoury column
On which bright rainbows beam the smiles of mercy, —
Hath risen well-nigh six thousand years to heaven,
In unison with that astounding chorus
Of multitudinous and white-robed waters,
So glorious in the fury of their rapture
Around their awful and mysterious centre!
And oft, stupendous Cataract, as winter
Comes listening to thy choral hallelujahs,

[1] Charles Dickens records this impression.

And gazing on thy pomp of rising incense; 1839
With mimic semblance of some mighty temple Grinfield
He loves to grace thee, and thy shaggy borders
Fantastically silvers o'er with frost-work;
Pranking with icy pinnacles and pillars
The walls of thy magnificent Cathedral:[1]
But ne'er Cathedral owned a crypt so dreadful
As thine, o'er-arch'd with such a thundering deluge.
And still the thunder of the eternal anthem,
And still the column of ascending incense,
Shall draw remotest pilgrims to thy worship,
Shall hold them breathless in thy sovereign presence,
And lost to all that they before had look'd on;
Yea, conjur'd up by strong imagination,
Shall sound in ears that never heard the music,
Shall gleam in eyes that ne'er beheld the vision;
Till the great globe, with all that it inherits,
Shall vanish,— like that cloud of ceaseless incense,—
In thunder,— like that falling world of waters.
Oh peerless paragon of earthly wonders!
Embodying, in their most intense expression,
Beauty, sublimity, might, music, motion,
To fix and fill at once eye, ear, thought, feeling;
And kindling, into unknown exaltation,
Dread and delight, astonishment and rapture!
Sure GOD said, let there be a NIAGARA!
And, lo, a NIAGARA heard His bidding;
And glimmer'd forth a sparkle of His glory,
And whisper'd here the thunder of Omnipotence!

Clifton, April, 1839.

[1] Mrs. Jameson describes its weighty magnificence.

1840

CLARK, WILLIS GAYLORD. (Poem). (*In* Holley, W., Niagara; its history and geology, incidents and poetry. . . . N. Y. Buffalo, Clark Toronto.: 1872. Pp. 161–162.) 1840

1840 Clark

The author was an American journalist, the editor of the Philadelphia Gazette.

Here speaks the voice of God — let man be dumb,
Nor with his vain aspiring hither come.
That voice impels the hollow-sounding floods,
And like a Presence fills the distant woods.
These groaning rocks the Almighty's finger piled;
For ages here his painted bow has smiled,
Mocking the changes and the chance of time —
Eternal, beautiful, serene, sublime!

1840 Clinch

CLINCH, *Rev.* JOSEPH H. Niagara. (*In his* The Captivity in Babylon, and other poems. Bost.: Burns. 1840. Pp. 77–81.)

Ten stanzas descriptive of the author's emotion, musings and reflections on the Falls and their scenery.

1840 Cooper

COOPER, JAMES FENIMORE. The pathfinder; or The inland sea. . . . Phila.: Lea and Blanchard. 1840. 1:47–49. 2:52–53.

Conversation about Niagara.

1840

———————. Legend of the whirlpool. Buffalo, N. Y.: Press of Thomas & Co. 1840.

A story told in verse of a battle to the death in the waters of the whirlpool between Huron and Iroquois.

1840 M'Jilton

M'JILTON, J. N. Niagara. (*In his* Poems. Bost.: Otis, Broaders. 1840. Pp. 112–115.)

A tribute to the restlessness and might, the terror and beauty of the resistless and everlasting torrent.

1840 Tappan

TAPPAN, WILLIAM B. Niagara. (*In his* Poet's tribute; poems of William B. Tappan. Bost.: King, Crocker and Brewster. 1840. P. 30.)

Niagara! — the poetry of God!
Whose numbers tell, in everlasting hymn,
Only of God! The morning stars that woke
Music along their courses, early caught
Its far off echoes, and in wild delight
Returned them, softened, round the universe.

Think not, think not, Earth's triflers! that for *you* 1840
And garish Day, these melodies chime on. Tappan
When ye, diminished, lost, are known not, Night,
Night to the awful anthem ever hearkens,
And ever with new joy. Oh, how sublime
The symphony, that, under the expanse
Of stars, peals on in unexhausted power:
Niagara! — and the sole listener, Night!

1841

Alida; or, Miscellaneous sketches of incidents during the late American war founded on fact. With poems. By an unknown author. 3d ed. rev. & imp. N. Y.: Printed for the author. 1841. Pp. 183–191. 1841

GURNEY, JOSEPH JOHN. A journey in North America, described in familiar letters to Amelia Opie. Norwich: Printed for private circulation. 1841. P. 320. 1841 Gurney

Six hundred twenty thousand tuns, each minute, is the measure,
That fills thy giant bowl for us with wonder, awe, and pleasure;
Niagara the great, the free, old Erie's swift discharger,
The billowy breast that banished thee, but sends thee to a larger.
Ontario bids a welcome to thy foaming, gushing waters,
That freshly fill her yawning caves, and nourish all her daughters.
Sunshine and rain contend for thee, thou plaything of all weathers,
Thy falling flood of glass and pearls breaks into fairest feathers;
But where the deeper billows roll o'er the centre of thy crescent,
Thy vest is of liquid emerald, with native snows florescent.
Thy stream below is a floating field of winter's purest whiteness,
Till it melts away into green and grey, rejoicing in its brightness.
Clouds of thy own creation rise, in wild array, around thee,
And in her zone of magic hues, the radiant bow hath bound thee.
Farewell, flow on — in bygone worlds thy veteran locks were hoary,
And forests wild, untrod by man, have sung thine ancient glory.

1841 Gurney

A meaner muse of modern days, now ventures to admire thee,
Her music thou may'st well despise — thy own shall never tire thee.

1841 H. E. D.

H. E. D. The fugitive slave's apostrophe to Niagara. (*In* Buckingham, Joseph T., Personal memoirs and recollections of editorial life. Bost.: Ticknor, Reed, Fields. 1852. 2:192–194.)

An apostrophe, ringing and strong, to Niagara as the boundary of the land of liberty.

1841 Morpeth

[1] MORPETH, GEORGE WILLIAM FREDERICK HOWARD, *Lord.* Niagara Falls. (*In* Holley, G. W., Niagara; its history and geology, incidents and poetry. . . . N. Y. Buffalo, Toronto: 1872. P. 162.)

Lord Morpeth, who was Lord Lieutenant of Ireland from 1855 to 1864, made three visits to Niagara Falls These lines were written after 1841.

There's nothing great or bright, thou glorious Fall!
Thou mayest not to the fancy's sense recall.
The thunder-riven cloud, the light'ning's leap,
The stirring of the chambers of the deep;
Earth's emerald green, and many tinted dyes,
The fleecy whiteness of the upper skies;
The tread of armies thickening as they come,
The boom of cannon and the beat of drum;
The brow of beauty and the form of grace,
The passion and the prowess of our race;
The song of Homer in its loftiest hour,
The unresisted sweep of human power;
Britannia's trident on the azure sea,
America's young shout of Liberty!
Oh! may the waves which madden in thy deep
There spend their rage nor climb the encircling steep;
And till the conflict of thy surges cease
The nations on thy banks repose in peace.

[1] Succeeded to title, Earl of Carlisle.

1842

APPLETON, THOMAS GOLD. Goat Island, Niagara. (*In his* Faded leaves. Bost.: Roberts Bros. 1872. P. 33.) **1842** Appleton

Peace and perpetual quiet are around.
Upon the erect and dusky file of stems,
Sustaining yon far roof, expelling sound,
Through which the sky sparkles (a rain of gems
Lost in the forest's depth of shade), the sun
At times doth shoot an arrow of pure gold,
Flecking majestic trunks with hues of dun,
Veining their barks with silver, and betraying
Secret initials tied in true love knots;
Of hearts no longer through green alleys straying,
But stifled in the world's distasteful grots.
The silence is monastic, save in spots
Where heaves a glimmer of uncertain light,
And rich wild tones enchant the woodland night.

June, 1842.

APPLETON, THOMAS GOLD. Niagara. (*In his* Faded leaves. Bost.: Roberts Bros. 1872. Pp. 27–30.)

Though the dusk has extinguished the green
And the glow of the down-falling silver,
In my heart I prefer this subdued,
Cathedral-like gloom on the water;
When the fancy capriciously wills,
Nor loves to define or distinguish,
As a dream which enchants us with fear,
And scarce throbs the heart unaffrighted.
With a color and a voice of its own
I behold this wondrous creature
Move as a living thing,
And joyous with joy Titanic.
Its brothers in sandstone are locked,
Yet from their graves speak to it.
It sings to them as it moves,

1842
Appleton

And the hills and uplands re-echo.
The sunshine kindles its scales,
And they kindle with opal and sapphire.
It uplifts its tawny mane,
With its undulations of silver,
And tosses through showers of foam,
Its flanks seamed with shadow and sunshine.
Like the life of man is its course,
Born far in some cloudy sierra,
Dimpled and wayward and small,
O'erleaped by the swerving roebuck;
But enlarging with mighty growth,
And wearing wide lakes for its bracelets,
It moves, the king of streams,
As a man wears the crown of his manhood.
It shouts to the loving fields,
Which toss to it flowers and perfume;
It eddies and winds round its isles,
And its kisses thrill them with rapture;
Till it fights in its strength and o'ercomes
The rocks which bar its progress.
The earth hears its cries of rage,
As it tramples them in its rushing,
Leaping, exultant above
And smiting them in derision;
Till at length, its life fulfilled,
Sublime in majestic calmness,
It submits to death, and falls
With a beauty it wins in dying,
Still, wan, prone, till curtains of foam enclose it,
To arise a spirit of mist,
And return to the Heaven it came from.

As deepens the night, all is changed,
And the joy of my dream is extinguished:

I hear but a measureless prayer, **1842**
As of multitudes wailing in anguish; Appleton
I see but one fluttering plunge,
As if angels were falling from heaven.
Indistinctly, at times, I behold
Cuthullin and Ossian's old heroes
Look at me with eyes sad with tears,
And a summons to follow their flying,
Absorbed in wild, eerie rout,
Of wind-swept and desolate spectres.
As deepens the night, a clear cry
At times cleaves the boom of the waters;
Comes with it a terrible sense
Of suffering extreme and forever.
The beautiful rainbow is dead,
And gone are the birds which sang through it.
The incense so mounting is now
A stifling, sulphurous vapor,
The abyss is the hell of the lost,
Hopeless falling to fires everlasting.

June, 1842.

H. D. M. The Falls of Niagara. (West. lit. mess'gr. Aug. 17, 1842. 2:56.) **1842** H. D. M.

An original poem from the " album of Mr. Hooker."

Majestic! and stupendous! Wonder-work,
Sublime beyond Imagination!
Beyond expression, glorious and grand!
Awe-struck I stand, soul-swelling with emotion
Too powerful for thought; soul-wrapt with feeling
Too mighty for endurance. Yet to feel
Thus for one moment, might repay existence,
Though life had been more darkly cast than mine,
And mine has been — no matter: Now I'm blest.

1842
H. D. M.

I gaze till I am lost in what I gaze on;
Sense flies; self vanishes; I mingle with,
And am a part of what I see and hear,—
The foaming torrents, and their deaf'ning roar!
At once elated and depressed, my soul
Drinks in the spectacle, conscious alike
Of weakness and power. 'Tis glorious!
I swear 'tis glorious! — Altar and fountain
Of the Eternal God! — And there ye roll
Ye volumed waters, from age unchronicled,
To ages moveless in the womb of time!
Forever changing, yet fore'er the same: —
The same when broke the promise-bow of heaven,
To diadem your awful brow; the same,
When bent the red-man o'er your thundering fall: —
To be the same when earth and sky shall meet
In final wreck, and mute eternity
Forever reign! O! ye are wonderful,
Ye massive rocks! Ye rapids in your rush!
Ye trembling cataracts! thou boiling surge!
To heaven up-rising like the good man's prayer,
In the dark hour of tumult and dismay.
And O! thou dread abyss in which are poured
Those endless torrents, that thy fountains lash
To tempest fury in their reckless fall,
O! ye are dizzy to the mortal eye,
And terrible — most terrible to mortal sense!
And the loud roar of your undying thunder!
Ah! what is Man to your surpassing might?
And what are you, proud monuments of Time,
To Him who called you from the depths of nought,
And cast you careless from his plastic hand,
The playthings of Omnipotence?

Omnipotence! Eternity! oh there, 1842
Rise thou my thought! fix thou my soul on Him, H. D. M.
Th' Omnipotent — the Eternal! led by Him,
Safe o'er the cataracts of time, to dwell
Sweetly embosomed on the shores of bliss.

1843

BACON, EZEKIEL. Aegri Somnia; recreations of a sick room. N. Y.: J. Allen. 1843. Pp. 105–107. 1843 Bacon

A poem entitled "Niagara Falls"; religious in tone.

LISTON, JAMES KNOX. Niagara Falls; a poem in three cantos. . . . Toronto: Author. 1843. 1843 Liston

This poem exalts Niagara as a monument of divine power, describes the Falls under various aspects, assails the wicked policy of the United States in aiding Bonaparte, describes the Battle of Lundy's Lane with reflections on the war, discusses the Fall of Man and contains a prayer.

CHANNING, WILLIAM ELLERY. The Niagara Fall. (*In his* Poems. Bost.: Little and Brown. 1843. P. 35.) 1843 Channing

'Tis the boom of the fall with a heavy power
Solemn and slow as a thunder-cloud
Majestic as the vast ocean's roar
Though the green trees round its singing crowd,
And the light is as green as the emerald grass
Or the wide leaved plants in the wet morass
It sounds over all, and the rushing storm
Cannot wrinkle its temples or wave its hair.
It dwells alone in the pride of its form,
A lonely thing in the populous air
From the hanging cliffs it whirls away,
All seasons through, all the livelong day.

1844

BULL, SARA C. (Ole Bull's "Niagara") (*In her* Memoirs of Ole Bull. Bost.: Houghton, Mifflin & Co. 1886. Pp. 169–172.) 1844 Bull

An account of Ole Bull's composition "Niagara," which was played in public for the first time in New York in the winter of 1844. A

1844 Bull

criticism of N. P. Willis, and one of Mrs. Lydia Maria Childs are included in this account. Portions of both these criticisms are quoted below.

Willis says:

We believe that we have heard a transfusion into music — not of "Niagara," which the audience seemed *bona-fide* to expect, but of the *pulses of a human heart at Niagara*. We had a prophetic boding of the result of calling the piece vaguely "Niagara,"— the listener furnished with no "argument" as a guide through the wilderness of "treatment" to which the subject was open. . . .

The emotion at Niagara is all but mute. It is a "small, still voice" that replies within us to the thunder of waters. The musical mission of the Norwegian was to represent the insensate element *as it was to him* — to a human soul, stirred in its seldom reached depths by the call of power. It was the *answer* to Niagara that he endeavored to render in music — not the *call!*

Mrs. Childs says:

. . . The sublime waterfall is ever present with its echoes, but present in a calm, contemplative soul. One of the most poetic minds I know, after listening to this music, said to me: "The first time I saw Niagara, I came upon it through the woods, in the clear sunlight of a summer's morning; and these tones are a perfect transcript of my emotions!" In truth, it seems to me a perfect disembodied poem; a most beautiful mingling of natural sounds with the reflex of their impressions on a refined and romantic mind. This serene grandeur, this pervading beauty, which softens all the greatness, gave the composition its greatest charm to those who love poetic expression in music; but it renders it less captivating to the public in general than they had anticipated. Had it been called a Pastorale composed within hearing of Niagara, their preconceived ideas would have been more in accordance with its calm, bright majesty.

CRANCH, CHRISTOPHER PEARSE. The cataract isle. (*In* Johnson, R. L., Niagara; its history, incidents, and poetry. . . . Wash:; W. Neale. 1898. Pp. 49–50.) 1844 Cranch

The author was an American landscape painter, a poet and translator. His verses have artistic and literary merit.

I wandered through the ancient wood
  That crowns the cataract isle.
I heard the roaring of the flood
  And saw its wild fierce smile.

Through tall tree-tops the sunshine flecked
  The huge trunks and the ground
And the pomp of fullest summer decked
  The island all around.

And winding paths led all along
  Where friends and lovers strayed,
And voices rose with laugh and song
  From sheltered nooks of shade.

Through opening forest vistas whirled
  The rapids' foamy flash,
As they boiled along and plunged and swirled,
  And neared the last long dash.

I crept to the island's outer verge,
  Where the grand, broad river fell —
Fell sheer down amid foam and surge
  In a white and blinding hell.

The steady rainbow gaily shone
  Above the precipice,
And the deep low tone of a thunder groan
  Rolled up from the drear abyss.

1844
Cranch

And all the day sprang up the spray
  Where the broad white sheets were poured,
And fell around in showery play,
  Or upward curled and soared.

And all the night those sheets of white
  Gleamed through the spectral mist,
When o'er the isle the broad moonlight
  The wintry foam-flakes kissed.

Mirrored within my dreamy thought,
  I see it, I feel it all —
That island with sweet visions fraught,
  That awful waterfall.

With sun-flecked trees, and birds and flowers,
  The Isle of Life is fair;
But one deep voice thrills through its hours,
  One spectral form is there —

A power no mortal can resist,
  Rolling forever on —
A floating cloud, a shadowy mist,
  Eternal undertone.

And through the sunny vistas gleam
  The fate, the solemn smile.
Life is Niagara's rushing stream:
  Its dream — that peaceful isle!

1845

1845
Sigourney

SIGOURNEY, *Mrs.* LYDIA H. Scenes in my native land. Boston: James Munroe and Co. 1845. Pp. 3–20; 148–161; 317–318.

Prose and poetry descriptive of Niagara Falls. Pp. 3–20, Niagara. Pp. 148–161, The hermit of the Falls. Pp. 317–318, Farewell to Niagara.

1846

BURROUGHS, *Rev.* CHARLES. Niagara Falls. (*In his* The poetry of religion and other poems. Bost.: Ticknor, Reed and Fields. 1851. Pp. 62–66, 67–68.) 1846 Burroughs

Composed at Niagara August 10, 1846. To the clergyman-author the rush of the waters was a song of rapture to God, the clouds of spray were incense, the rainbow was a reminder of redemption by Christ, the cliffs were altars, and the whole Falls an inspiration to worship.

CLINTON, GEORGE W. Sketches of Niagara falls and river, by Cousin George. Buffalo: Peck. 1846. 1846 Clinton

An imaginary conversation about the scenery between " Cousin George " and his two young cousins as the three walk about the Falls.

Francis Abbott; or, The hermit of Niagara. A tale of the old and new world. By the author of Mattallak &c. Boston: Gleason's Publishing Hall. 1846. 1846

(The) grave of Washington; Villa of Mount Vernon, and Key to the Bastille; and banks of Niagara. Edinburgh: William Whyte and Co. 1846. Pp. 37–40. 1846

A poem of sixteen four-line stanzas. An exhortation to reverence before the mighty flood and reflections on human nature inspired by contemplation of the Falls.

1847

BROWNELL, HENRY HOWARD. Niagara. (*In his* Poems. N. Y.: D. Appleton & Co. Phila.: Geo. S. Appleton. 1847. Pp. 38–45.) 1847 Brownell

Has aught like this descended since the fountains
  Of the Great Deep, broke up, in cataracts hurled,
And climbing lofty hills, eternal mountains,
  Poured wave on wave above a buried world?

Yon tides are raging, as when storms have striven,
  And the vexed seas, awaking from their sleep,
Are rough with foam, and Neptune's flocks are driven
  In myriads o'er the green and azure deep.

1847
Brownell

Ere yet they fall, mark (where that mighty current
Comes like an army from its mountain home)
How fiercely yon steeds amid the torrent
With their dark flanks, and manes and crests of foam.

Speed to their doom,— yet, in the awful centre,
Where the wild waves rush maddest to the steep,
Just ere that white, unfathomed gulf they enter,
Rear back in horror from the headlong leap.

Then, maddening, plunge. A thousand more succeeding
Sweep onward, troop on troop, again to urge
The same fierce fight, as rapid and unheeding,—
Again to pause in terror on the verge.

Oft to an eye half closed, as if in solving
Some mighty, mystic problem — half it seems
Like some vast crystal wheel, ever revolving,
Whose motion, earth's — whose axle, earth's extremes.

We gaze and gaze, half lost in dreamy pleasure,
On all that slow majestic wave reveals,
While Fancy idly, vainly strives to measure
How vast the cavern which its veil conceals.

. . . . .

Whence come ye, O wild waters? By what scenes
Of majesty and Beauty have ye flowed,
In the wide continent that intervenes,
Ere yet ye mingle in this common road?

The Mountain King, upon his rocky throne,
Laves his broad feet amid your rushing streams,
And many a vale of loveliness unknown
Is softly mirrored in their crystal gleams.

1847
Brownell

They come — from haunts a thousand leagues away,
From ancient mounds, with deserts wide between,
Cliffs, whose tall summits catch the parting day,
And prairies blooming in eternal green;

Yet the bright valley, and the flower-lit meadow,
And the drear waste of wilderness, all past —
Like that strange Life of which thou art the shadow,
Must take the inevitable plunge at last.

Whither we know not — but above the wave
A gentle, white-robed spirit sorrowing stands,
Type of the rising from that darker grave,
Which waits the wanderer from Life's weary lands.

How long these wondrous forms, these colours splendid,
Their glory over the wilderness have thrown!
How long that mighty anthem has ascended
To Him who wakened its eternal tone!

That everlasting utterance thou shalt raise,
A thousand ages ended, still the same,
When this poor heart, that fain would add its praise,
Has mouldered to nothing whence it came;

When the white dwellings of man's busy brood,
Now reared in myriads o'er the peopled plain,
Like snows have vanished, and the ancient wood
Shall echo to the eagle's shriek again,

And all the restless crowds that now rejoice,
And toil and traffic, in their eager moods,
Shall pass — and nothing save thine awful voice
Shall break the hush of these vast solitudes.

1847 Coles

COLES, ABRAHAM. Niagara. (*In his* The microcosm, and other poems. N. Y.: Appleton. 1881. Pp. 219–222.)

An apostrophe to the majesty, might, swiftness, and awfulness of Niagara. The author feels that

> Though this may seem,
> Type of Eternity, 'twill pass away,
> A murmurous dream.

1848

1848 Bulkley

BULKLEY, C. H. A. Niagara. A poem. N. Y.: Leavitt, Trow & Co. 1848. P. 55.

The author tells us that these 3,600 lines are an attempt to answer the demand for a "poem of more than ordinary length, truly American in its character" on Niagara Falls. He says that his "object has been not so much to describe at length the scenery of Niagara, in order to excite emotions in the reader similar to those of the beholder, for this would be vain endeavor, as to give a transcript of what passes through the mind of one who is supposed to witness so grand an achievement of nature." The poem is tedious, with commonplace intervals, although it occasionally rises to the heights of true poetry. The analysis which follows gives an idea of the ambition and scope of the undertaking.

ANALYSIS

Introductory apostrophe — themes proposed. Apostrophe to the Fall as a vast form of life. The presence-chamber of God. A knight-errant. Restless spirits. The streams — their lament — its uselessness. The Torrent like Time. A mourner over men and nations. The Indian — his chase — his death-song — his fall. Apostrophe to the Cataract as a Destroyer — an Historian — a warning Prophet — an oracle of Truth — a Chronicler undying — a tireless Laborer — and unswayed by man. The islands — refuge-spots — so are some hearts. Winter — the Fall ice-imprisoned. Spring — with a song of Liberty. Apostrophe to Niagara River — passage down its banks. The Cliffs — Death of Hungerford. The Cave of the Winds. The Pin-

nacle-Rock. The Whirlpool. Apostrophe to the Fall respecting its origin and early life. The Fall's Invocation to the Creative Spirit for the Seasons. Evening and Night. The Hermit of the Fall — his birth-place and character — his strain — his melancholy and aspirations — his strife, disappointment, doom, fearful deed, remorse, and death. The Fall a witness of Redemption. Sunrise — typical of Genius. Hymn of Praise. Noon. The Flood's Invocation. Poet. Musician. The Table-Rock. Beneath the Sheet. The Cataract's hymn to the Creator. Proof of Deity. The Doom of Time, with the Flood's death-dirge and fall. The Farewell to the Cataract. 1848 Bulkley

Spirit of the Fall

What towering form erects its figure here,
To check the footsteps of inquiring man,
As if it were a sentry at his post,
To guard with faithfulness the narrow pass?
It is the Rock of Manitou, the Pinnacle
On which the gloomy spirit of the Fall,
Sits brooding o'er the tide below, that shows
His fearful frowns reflected in its wave,
Or feels the movements of his busy hand
Searching its depths and torturing its course,
Till its full currents reel in conscious pain!

How high the Water-God his altar rears
With jagged summits from a liquid base!
How green the moss that decks its time-worn crown,
Like youthful forms that cluster round old age!
From yonder cliff, impending o'er the stream
With shadowy fringes of the evergreen,
This massive pile, like an inverted cone,
Seems hurled in other years with giant hand,
Upon the kindred masses dashed below!

1848 Cooper. COOPER, JAMES FENIMORE. The oak openings; or, The bee-hunter. . . . N. Y.: Burgess, Stringer. 1848. 2:216–217.

In one particular, touching which we do not remember ever to have seen anything said, we were actually astonished at the surglory of Niagara. It was the character of sweetness if we can so express it, that glowed over the entire aspect of the scene. We were less struck with the grandeur of the cataract, than with its sublime softness and gentleness.

1848 Hine. HINE, E. CURTISS. A night on the Niagara. (*In his* The haunted barque, and other poems. Auburn: Derby. 1848. Pp. 67–70.)

The poet, who has gone down to a boat in the river to enjoy the beauty of the night, awakes from dreamy sleep to find himself drifting down stream without oars. After the most agonizing reflections, he finally saves himself by jumping on an island.

1848 Kelsey. KELSEY, RICHARD. Niagara. Jephthah. Remarks upon the defence of Wessex by Alfred the Great; with other compositions, in verse and prose. Lond.: 1848.

A poem of extravagant apostrophe often to be found in London bookshops.

1848 ———. Niagara, a poem, by a member of the Ohio bar. N. Y.: Edward O. Jenkins. 1848.

Describes the Falls from above, from below, gives the reflections inspired by the sight. It rises to its best in the last lines, beginning, " Then so live —

Even now
When life appears most joyous, and its waves
Take up a brisker dance, thou may'st approach
The dreadful cataract. No power averts,
No prayers postpone thine advent. Then so live,
That when in the last fearful mortal hour,
Thy wave, borne on at unexpected speed,
O'erhangs the yawning chasm, soon to fall,
Thou start not back affrighted, like a youth
That wakes from sleep to find his feeble bark
Suspended o'er Niagara, and with shrieks
And unavailing cries alarms the air,

Tossing his hands in frenzied fear a moment, 1848
Then borne away forever! but with gaze
Calm and serene look through the eddying mists,
On faith's unclouded brow, and take thy plunge
As one whose Father's arms are stretched beneath,
Who falls into the bosom of his God!

1849

BABCOCK, JAMES STAUNTON. Nia'gara. (*In his* Visions and voices. Hartford: Hunt. 1849. Pp. 131–132.) 1849 Babcock

An apostrophe to the " matchless Flood." A description of the Falls at night together with reflections on the evanescence of man and the everlastingness of Niagara.

STREET, ALFRED BILLINGS. Frontenac; a poem. Lond.: Richard Bentley. 1849. P. 157–158. 1849 Street

A poem in nine cantos giving the history of Frontenac's expedition against the Indians in 1696. In canto VI are found the Niagara verses, the last of which is quoted below:

'Twas O-ni-ah-ga-rah there that hurled
Its awful grandeur down its rock;
Dim sign of that dread shape a world
Reeling. shall see, when with fierce shock
He'll plant His tread on sea and shore,
And swear that Time shall be no more.
Farther my harp is mute to tell
Of the Sublime — The Terrible.

WELLSTEED, J. The Falls of Niagara. (West. lit. mess'gr., July, 1849. 12:232.) 1849 Wellsteed

All must confess who view this wondrous scene,
That if God were not, this had never been;
His voice here thunders in the mighty flood,
And these rent rocks proclaim, their maker God.
I love the dullness of the Cataract's roar,
And the wild grandeur of its craggy shore,

1849
Wellsteed

I love to look upon the gulf below,
Foaming and white like wildly-drifting snow;
I love to watch the cloud-like mists that rise,
To pay their weeping homage in the skies,
And when the blazing orb of day burns low,
I love to gaze upon the glorious bow,
And mark the beauties of that " bridge where time,
Of light and darkness, forms an arch sublime,"
These wonders calm the passions of the mind,
And waken thoughts that leave the world behind.
I love to linger till the envious night,
Draws her dark curtain o'er the gorgeous sight,
And when again the " balmy hour of rest,"
Returns, soft soother of the world distress'd,
The Cataract's roar shall lull me to repose,
And slumber shut the door of mem'ry on my woes.

1850

1850
Gould

GOULD, HANNAH F. Flower of Niagara. (*In her* New poems. Bost.: Reynolds. 1850. Pp. 150–152.)

A moralizing poem inspired by a delicate white anemone plucked from a crevice in the limestone rock under the water sheet at the Falls.

1850
Willis

Table rock album and sketches of the Falls and scenery adjacent. 3d. ed. Buffalo: Jewett, Thomas and Co. 1850.

From the 1850 period and for some years, public albums were kept at the Table Rock and other points of interest at the Falls, for the record of " Impressions " by the visitors. Several volumes of selections from these albums have been published, and while most of the would-be poetry which they contain is doggerel, occasionally there is a gleam of wit. The editor of one of these feels it is a matter of regret that " the innumerable host of visitors who have perpetuated composition in the volumes of manuscript now before us, should have added so little to the general stock of legitimate and permanent literature."

One of the best of these humorous verses is that credited to N. P. Willis.

To view Niagara Falls one day, 1850
A parson and a tailor took their way; Willis
The parson cried whilst wrapped in wonder,
And listening to the cataract's thunder,
Lord! how thy works amaze our eyes,
And fill our hearts with vast surprise;
The tailor merely made this note —
Lord! what a place to sponge a coat!

Another wrote in the album:

I have been to "Termination Rock,"
Where many have been before;
But as I can't describe the scene
I won't say any more.

1851

Descent into the rapids of Niagara. An authentic narrative. 1851
(Knicker. [N. Y.], Oct., 1851. 38:414–416.)

The tale of a man who, moved to a frenzy of madness and forgetfulness by the Falls, allowed himself to float down the rapids in a skiff, which was fortunately shattered on a rock below Goat Island bridge, leaving the man to be rescued.

SCHOOLCRAFT, HENRY R. Niagara, an allegory. (*In his* The 1851
American Indians. . . . Rochester: Wanzer, Foot. 1851. Schoolcraft
P. 407.)

A poem about the old gray man of the mountain and his five daughters, the five lakes, who ran away to look at the sea.

(SCHOOLCRAFT, HENRY ROWE.) Western scenes and reminiscences; together with thrilling legends and traditions of the red men of the forest. . . . Auburn: Derby and Miller. Buffalo: Derby, Orton, and Mulligan. 1853. P. 407.

Contains "Niagara, an allegory."

1854

MCGUIRE, MICHAEL. Thoughts on Niagara. (*In* Artman, William 1854
and Hall, L. V., Beauties and achievements of the blind. Dansville, McGuire
N. Y.: Pub. for the authors. 1854. Pp. 363–365.)

Niagara Falls

1854
McGuire

I stood where swift Niagara pours its flood
Into the darksome caverns where it falls,
And heard its voice, as voice of God, proclaim
The power of Him, who let it on its course
Commence, with the green earth's first creation;

And I was where the atmosphere shed tears,
As giving back the drops the waters wept,
On reaching that great sepulchre of floods,—
Or bringing from above the bow of God,
To plant its beauties in the pearly spray.

And as I stood and heard, *though seeing naught*,
Sad thoughts took deep possession of my mind,
And rude imagination venturing forth,
Did toil to pencil, though in vain, that scene,
Which, in its every feature, spoke of God.

"The poem develops a pathetic prayer for sight; and employs much exalted imagery attuned to the central idea that here Omnipotence speaks without ceasing; here is A temple where Jehovah is felt most."

1854
Brown

Brown, David Paul. Upon being asked to describe Niagara. (*In* Springs, water-falls, sea-bathing resorts, and mountain scenery of the United States and Canada; . . . N. Y.: J. Disturnell. 1855. P. 106.)

Describe it! Who can ere describe
The lightning's flash — the thunder's roll.
Say what is Life, or what is Death,
Or paint the portrait of the Soul?

Describe the rainbow in the spray,
The rapids in their wild career —
Raging like ravenous beasts of prey,
While all creation shrinks with fear?

Go sketch and paint the humblest flower 1854
That lends its fragrance to the grove; Brown
Go trace the feeblest star that gleams
From the cerulean vaults above.

Exhaust thyself, vain-glorious man,
On scenes and subjects fit for thee,
Nor dare presumptuously to scan
The wondrous works of Eternity.

The works of an Almighty hand
None can depict — though all adore!
Terrific — bold and beautiful.
They breathe the sov'reignty of power.

O God! it seems to me most strange
That any man so mad should be
To doubt, to disbelieve Thy power
When thus, Creation speaks to Thee.

1855

Emily and Clara's trip to Niagara Falls; by the editor of "*The youth's casket.*" N. Y.: Phinney, Blakeman, and Mason. [ca. 1855.] Pp. 1–43.) 1855

A simple and interesting story giving a good idea of the different points of interest at the Falls.

Table rock album and sketches of the Falls and scenery adjacent. Buffalo: Thomas and Lathrops. 1855. 1855

1857

CUTTER, G. W. Morning at the Falls. (*In his* Poems and fugitive pieces. Cincinnati: Moore, Wilstach, Keys. 1857. Pp. 266–268.) 1857 Cutter

The author found it a fearful thing to look on the Falls, to feel the shock of the falling waters, and to see the vapor and rainbows.

1857 Cutter

CUTTER, G. W. Niagara. (*In his* Poems and fugitive pieces. Cincinnati: Moore, Wilstach, Keys. 1857. Pp. 180–183.)

The author describes the waters, rapids, and Falls until his muse drops her lyre in affright before the solemn grandeur of the scene.

1857 Longfellow

LONGFELLOW, S. Under the bridge at Niagara. (*In his* Hymns and verses. Bost.: Houghton, Mifflin. 1894. Pp. 100–101.)

1858

1858 Canale

CANALE, G. D. To Niagara. (Lit. liv. age, Aug. 28, 1858. 58:716.)

The translation of a short Greek lyric poem written July 10, 1858. "The poem is marked for its simplicity and beauty."

1858 Foster

F[OSTER], F[ANNY] E[LIZA]. Lines to a friend at Niagara. (*In her* Pebbles of poetry. Bost.: Foster. 1858. P. 20.)

1858 Gaskell

GASKELL, MRS. An incident at Niagara. (Harp. w., June, 1858. 17:80–82.)

A dramatic tale, well-told, of the heroic rescue of two Irishmen from a small island in the midst of the rapids.

1859

1859

Table rock album and sketches of the Falls and scenery adjacent. Buffalo: E. R. Jewett. 1859.

1860

1860 Merritt

MERRITT, J. P. Canada seventy years ago, or Prince Edward's visit to Niagara. 3d. ed. St. Catharines, Ont.: 1860.

1864

1864 Savage

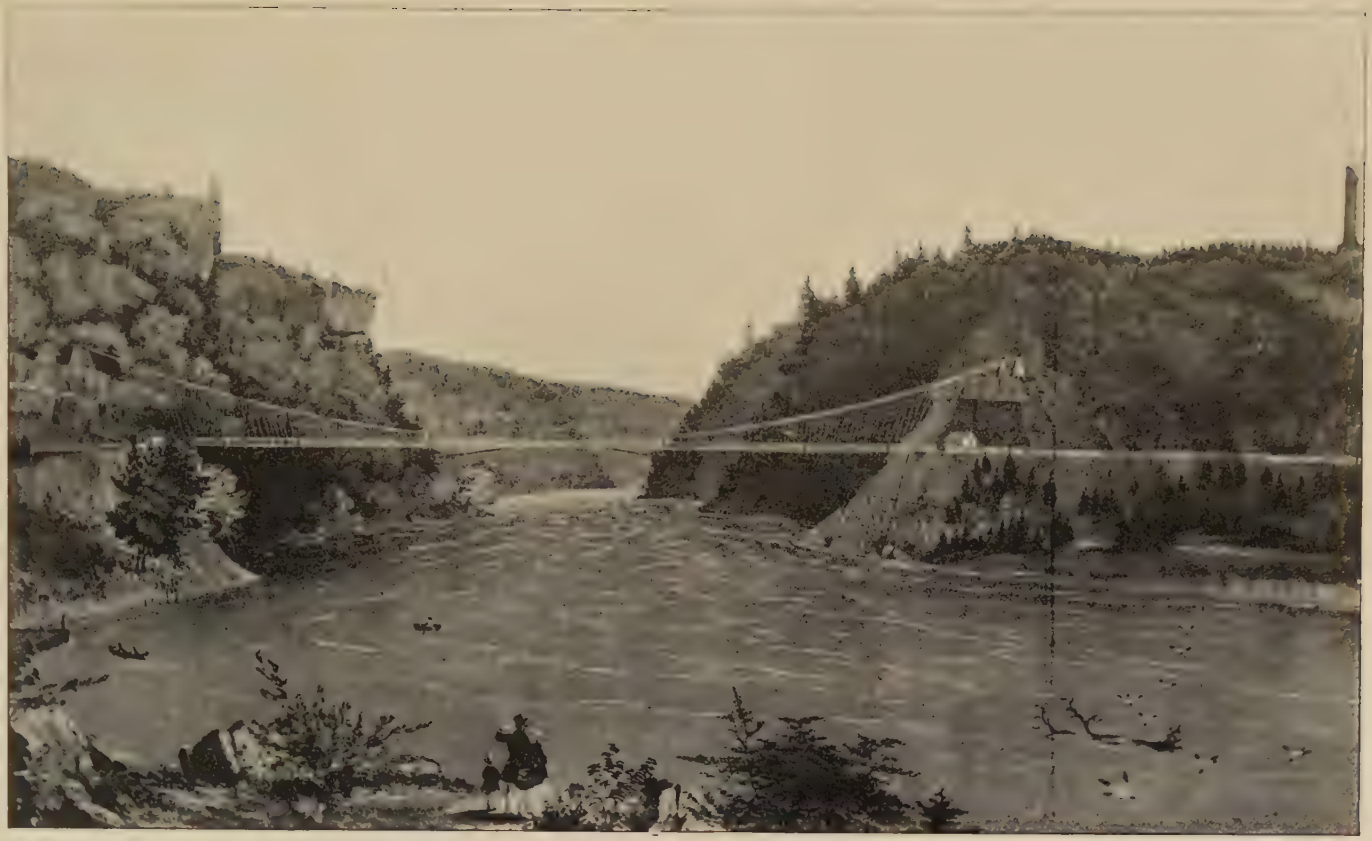
SAVAGE, JOHN. At Niagara. (*In his* Faith and fancy. N. Y.: Kirker. 1864. Pp. 61–63.)

A poem in two parts describing the rapids and the feelings inspired by the Falls.

1865

1865 Richards

RICHARDS, W. C. Niagara in spring. (Harp., Sept., 1865. 31:428.)



View of the Old Suspension Bridge above the Whirlpool Rapids

1865
Richards

Oh, could I gaze forever on thy face,
Unwearied still, thou matchless waterfall,
Whose twining spells of majesty and grace
My ardent sense bewilder and enthrall!

In all my moods thy charms, puissant sway,
Enforce my will their master-spell to own;
My heart leaps at thy voice — or grave or gay —
And every chord is vibrant to thy tone.

So many years I have come back to stand,
With reverent awe, before thy glorious shrine —
So close and long thy lineaments I've scanned —
It seems thou shouldst grow something less divine.

I know thy face, its shifting glooms and smiles,
As cloud or sun upon thy bosom lies;
Thy wrathful guise, thy witching, rainbow wiles
Can wake no more for me the sweet surprise.

I know thy voice — its terror and its glee
Have in my ear so oft their changes rung,
Nor forest winds nor anthems of the sea
Speak to my soul with more familiar tongue.

My feet have scaled thy storm-scarred battlements,
And pressed the moss most emerald with thy tears,
And still profaned thy lucent caverns, whence
The neophyte comes pale with ghostly fears.

Yet, as the more of God the soul perceives,
And nigher Him is drawn, it worships more;
So, in my heart, thy matchless beauty leaves
Constraint, in thine, His grandeur to adore.

1868

Now rise, muffled in mist, rolling up heavily,
Deep tones, awfully grand, shaking the earth, as they
Swell like the low bass of the thunder-storm,
Heard by the strained ear of the listener.

Thus float over the mist ever in harmony
Three tones, joyous and free, forming Niagara's
Anthem of praise, new every moment, yet
Changeless as time, old as eternity.

1869

1869
Dewart

DEWART, EDWARD HARTLEY. Songs of life; a collection of poems. Toronto: Dudley and Burns. 1869. Pp. 79–82.

A reflective poem of the emotions and thoughts stirred by Niagara. Religious in tone.

1869
Lord

LORD, JOHN C. The genius of Niagara. (*In his* Occasional poems. Buffalo: Breed and Lent. 1869. Pp. 19–22.)

A description of the proud demon of waters against whom Winter and Time are both powerless.

Proud Demon of the waters — thou
Around whose stern and stormy brow
Circles the rainbow's varied gem —
The Vapor Spirit's diadem —
While rushing headlong at thy feet,
The everlasting thunders meet.

Throned on the mists, around thy form
Is dashing an eternal storm,
Whose ceaseless, changeless earthquake shock
The tempests of old Ocean mock,
And the dark Sea-King yields to thee,
The meed of might and majesty.

1869
Lord

Depth, Sound, Immensity have lent
Their terrors to thy element;
Thy congregated waters yell
Down caverns fathomless as Hell,
While Heaven's glorious hues are set
About thy gorgeous coronet.

Titanic winter strives in vain
To bind thee in his icy chain,
Which rent by resistless wave
Finds in thy fearful depths — a grave;
Or the torn fragments glistening lie
In the glare of thy kingly eye.

A silvery web among thy trees
Unruffled by the passing breeze
The vanquished Ice-King for thee weaves,
And gives them gems for winter leaves,
And rears thee columns, bright and vast,
Their radiance through thy halls to cast.

The giant Time hath never yet
His footsteps in thy waters set;
Grimly passing thy fall, he tries
To notch his by-gone centuries
Along the dark and devious track
Of thy rock-crashing Cataract.

Emblem of Power — the mighty Sun
Hath found and left thee roaring on,
Thou wert with Chaos, e'er his light
Shone out upon the starless night,
Sole relic of that awful day
When all in wild confusion lay.

1869
Lord

And when Air, Earth, and Sea and Sky
Formless again together lie,
When judgment fires are kindling o'er
Old Nature's wreck — Niagara's roar,
First echo in the ear of Time,
Shall sing his requiem sublime.

1870

1870
Edwards

EDWARDS, C[HARLES] R. A story of Niagara. To which are appended reminiscences of a custom house officer. Buffalo: Breed, Lent. 1870. Pp. 1–289.

A story of smuggling on the frontier with scenes at the Falls.

1870
Hanaford

HANAFORD, *Mrs.* PHEBE A. Niagara. (*In her* From shore to shore and other poems. Bost.: D. B. Russell. San Francisco: A. L. Bancroft & Co. 1871. P. 215.)

This poem of Mrs. Hanaford's is not easy to find.

While many libraries contain some of her sermons and prose writings, few libraries of the present day contain "From shore to shore," which is typical of the taste of an earlier generation. Several collections of Niagara poetry will be found to contain Mrs. Hanaford's "Niagara."

Awe-struck I stand
Beside this avalanche of waves, and hear
The voice of God from out these watery depths.
Emotion-full, my soul in vain essays
To speak the thoughts that by this scene have birth.
Hark! to the voice of many waters here:
Like that great voice in Patmos heard by John,
It speaks of power, resistless energy,
And mighty purpose unconfined by man.
To me it speaks of God's almighty love,
Forever surging round the human soul:
The rocks of sin, the shoals of ignorance,
But bid those waves of love in tumult rise,

In rapids like old ocean's storm-waves, or, as here, 1870
In one vast water-sheet, the cataract's plunge. Hanaford
Thus shall it flow till time shall be no more,
And every soul is borne upon its waves,
All cleansed by its pure waters, to the land
Where, joyful, they shall all be moored at last.

1871

BARLOW, JOHN R. John's trip; or, A visit to Niagara falls. A 1871
serio-comic poem in four cantos. Niagara Falls: William Pool. 1871. Barlow

By the author of the "Maiden of the Mist." It tells of the trip of John, Downeast Hayseed, to New York City, up the Hudson, to Niagara, and adventures with Niagara Falls sharpers.

Up in the morning early
  Ere day was well begun,
John started forth to see the sights
  E'en with the rising sun.
But early though he took the road
  A "hack" was there as well;
And long the driver followed him
  And great things he did tell.

He said to John that he would show
  To him a view full rare
For five cents, and the trip should be
  Made in that carriage there.
John thought that that was cheap enough
  And therefore did agree;
He jumped into the hack and down
  That rare sight went to see.

John said I don't see how, my friend,
  You make this business pay,
To live at all you surely must
  Make many trips a day,

1871
Barlow

Or else for making money you
Must have some other ways.
The driver smiled a queerish smile
And simply said, it pays.

. . . . .

John gazed with admiration deep
Upon the rapids grand,
Which up in seeming merriment
Leapt high on every hand.

The driver broke John's rapture up
By asking him if he
Would like to see the Falls in all
Their mighty majesty.
He said no good view could be had
Unless they went *around;*
But *there* grand beauty unexcelled
Could easily be found.

John said " all right, we'll drive around,
I came the Falls to view,
And hang me if I don't intend
To see the whole thing through."
Poor foolish youth, his verdancy
Would make a cynic laugh,
Most anyone would be content
With seeing less than half.

But round they went and o'er the Bridge
And into Canada;
I'll guarantee John ne'er forgets
The trip he made that day.
And here allow me to remark
This game is often played,
They call it " turning," and God help
You when that " turn " is made.

1871
Barlow

They cross the Bridge then down the bank
The Table Rock to view,
And here is where the " Native Sharks "
Commence to " put you through."
Ere John had from the carriage stepped
A chap came out to know
If he would like a picture of
Himself and Falls also.

John asked the price, but not a word
Could he get in reply,
But round about with plates prepared
The operators fly;
And in a twinkling they turn out
A sight would make you laugh,
For which they tax poor simple John
Four dollars and a half.

Into the Table Rock House next
Poor John is soon betrayed,
And there they put him through as if
The devil lent his aid;
They show him Indian relics rich
And, believe me, they were raw;
John buys a lot of things for which
He does not care a straw.

John begs the driver to depart
Ere he be ruined quite,
But ere a dozen rods are made
He's doomed to re-alight.
And now the " Museum " minions
Around him quickly swarm,
And ere he's well upon his feet
He's dragged in by the arm.

1871
Barlow

They wrap him up in oilcloth robes
Ere he be well aware,
And o'er the street they hurry him
To take him down the stair;
John grabbed the railing and in words
By desperation lent,
Demanded of his captors grim
What they in thunder meant?

They told him they were taking him
Behind the waterfall,
And that the way was easy and
Not dangerous at all.
Still hanging on he asked how much
For *this* he'd have to pay;
" Just give the guide whate'er you wish,
That is the gen'ral way."

So John let go and followed them
Along the winding way,
But little worth for money spent
Did he get there that day.
His feet got wet, his boots got spoilt,
Likewise his collar too,
He gave the guides each fifty cents
To see that humbug view.

Then through the Museum he is led
And all the wonders shown,
Gathered from every spot on earth
From ev'ry land that's known.
They lead him through the office then
As butchers lead a calf,
And when he starts to go they say
Two dollars and a half.

" Two dollars and a half," says John, 1871
" Good gracious! what for now? Barlow
I haven't bought a single thing.
I'm sure you will allow."
" Two dollars of this sum is for
Your trip behind the sheet,
And fifty cents the Museum through
Just makes the sum complete."

" Oh but," says John, " I paid the guides,
I cannot pay you twice."
" That's nought to us," the " shark " replies,
" Two dollars is our price."
" 'Tis robbery I swear," says John,
" I'll pay it if I must,
Of all the ' beats ' that ever beat
You beat the very worst."

Then to the Battle Ground he went,
The Burning Spring as well,
Another dollar from his purse,
Which now had lost its swell.
The forenoon now was well nigh gone
And John had hungry grown,
His watch proclaimed this certain fact
Five hours had nearly flown.

Then homeward they in haste did drive,
They landed safe and sound;
John searched his pockets through and soon
A five-cent piece he found;
Then to driver he did hand
That five cent nickel piece;
The driver took it — turned it o'er,
And said " pray what is this? "

1871
Barlow

"Why that is for the ride," said John,
"The bargain was, you know,
The Falls and all the views around
For five cents you would show."
"Five cents be d——d," the driver said,
"I guess I'll make you sneeze,
Perhaps you take me for a 'flat;'
Ten dollars if you please."

"Oh Lord!" says John, "you heartless wretch!
I ne'er was used so sore,
You saw me robbed along the way
A dozen times or more,
But ne'er a warning you did give,
No word for me you had,
And now you rob me worst of all,
This really is too bad."

"I saw you robbed along the way?"
"Well, yes," the driver said,
"But why should I give warning when
I got the half you paid.
I didn't care a cuss so long
'S your pocket book held out,
If I had seen it running low
You bet I'd turned about."

"But don't imagine that I take
A cent more than is right.
The law allows me what I ask
I don't overcharge a mite,
Here are (established by the law)
Our latest rates of fare,
Just read them o'er and you will find
My charge is fair and square."

John pulled his pocket-book out slow 1871
And laid the money down, Barlow
"From this time I will ride no more
While I am in the town."
Then off to dinner he did go
Which was made ready soon,
Then by himself he strolled away
To spend the afternoon."

HOWELLS, WILLIAM DEAN. Avery. (*In his* Their wedding journey. Boston and N. Y.: Houghton Mifflin and Co. 1888. Pp. 139–141.) 1871 Howells

The hero recites these lines to the heroine as they sit on Goat Island at the brink of the rapids. It is a most graphic account in verse of unsuccessful attempts to rescue a man who had gone over the Fall. Since its first publication in Their wedding journey, it has appeared in several compilations of Niagara literature and verse, notably in Longfellow's Poems of places.

I

All night long they heard in the houses beside the shore,
Heard, or seemed to hear, through the multitudinous roar,
Out of the hell of the rapids as 'twere a lost soul's cries:
Heard and could not believe; and the morning mocked their eyes
Showing where wildest and fiercest the waters leaped up and ran
Raving round him and past, the visage of a man
Clinging, or seeming to cling, to the trunk of a tree that, caught
Fast in the rocks below, scarce out of the surges raught.
Was it a life, could it be, to yon slender hope that clung?
Shrill, above all the tumult the answering terror rung.

II

Under the weltering rapids a boat from the bridge is drowned,
Over the rocks the lines of another are tangled and wound,
And the long, fateful hours of the morning have wasted soon,
As it had been in some blessed trance, and now it is noon.
Hurry, now with the raft! But O, build it strong and stanch,
And to the lines and treacherous rocks look well as you launch

1871
Howells

Over the foamy tops of the waves, and the foam-sprent sides,
Over the hidden reefs, and through the embattled tides,
Onward rushes the raft, with many a lurch and leap,—
Lord! if it strike him loose from the hold he scarce can keep!
No! through all peril unharmed, it reaches him harmless at last,
And to its proven strength he lashes his weakness fast.
Now, for the shore! But steady, steady, my men, and slow;
Taut, now, the quivering lines; now slack; and so, let her go!
Thronging the shores around stand the pitying multitude;
Wan as his own are their looks, and a nightmare seems to brood
Heavy upon them, and heavy the silence hangs on all,
Save for the rapids' plunge, and the thunder of the fall.
But on a sudden thrills from the people still and pale,
Chorussing his unheard despair, a desperate wail;
Caught on a lurking point of rock it sways and swings,
Sport of the pitiless waters, the raft to which he clings.

III

All the long afternoon it idly swings and sways;
And on the shore the crowd lifts up its hands and prays:
Lifts to heaven and wrings the hands so helpless to save,
Prays for the mercy of God on him whom the rock and the wave
Battle for, fettered betwixt them, and who amidst their strife
Struggles to help his helpers, and fights so hard for his life,—
Tugging at rope and at reef, while men weep and women swoon.
Priceless second by second, so wastes the afternoon.
And it is sunset now; and another boat and the last
Down to him from the bridge through the rapids has safely passed.

IV

Wild through the crowd comes flying a man that nothing can stay,
Maddening against the gate that is locked athwart his way.
"No! we keep the bridge for them that can help him. You,
Tell us, who are you?" "His brother!" "God help you both! Pass through."

Wild, with wide arms of imploring he calls aloud to him, 1871
Unto the face of his brother, scarce seen in the distance dim; Howells
But in the roar of the rapids his fluttering words are lost
As in a wind of autumn the leaves of autumn are tossed.
And from the bridge he sees his brother sever the rope
Holding him to the raft, and rise secure in his hope;
Sees all as in a dream the terrible pageantry,—
Populous shores, the woods, the sky, the birds flying free;
Sees, then, the form,— that, spent with effort and fasting and fear,
Flings itself feebly and fails of the boat that is lying so near,—
Caught in the long-baffled clutch of the rapids, and rolled and hurled
Headlong on to the cataract's brink, and out of the world.

HOWELLS, WILLIAM DEAN. Their wedding journey. Boston and N. Y.: Houghton Mifflin and Co. 1888. Pp. 119–171, 288–319.

Howell's descriptions of the Niagara scenery in this story rank with the artistic and sympathetic study of Charles Dudley Warner in *Their pilgrimage*. Like Warner, Howells has used the Falls as a background upon which to project his characters. In the edition cited, the last chapter contains the story of *Niagara revisited* twelve years after their wedding journey. On page 139 is found the poem entitled *Avery* which is quoted separately.

I am not sure but the first emotion on viewing Niagara is that of familiarity. Ever after, its strangeness increases; but in that earliest moment, when you stand by the side of the American fall, and take in so much of the whole as your glance can compass, an impression of having seen it often before is certainly very vivid. This may be an effect of that grandeur which puts you at your ease in its presence; but it also undoubtedly results in part from lifelong acquaintance with every variety of futile picture of the scene. You have its outward form clearly in your memory; the shores, the rapids, the islands, the curve of the Falls, and the stout rainbow with one end resting on their top and the other lost in the mists that rise from the gulf beneath. On the whole I do not

1871
Howells

account this sort of familiarity a misfortune. The surprise is none the less a surprise because it is kept till the last, and the marvel, making itself finally felt in every nerve, and not at once through a single sense, all the more fully possesses you. It is as if Niagara reserved her magnificence, and preferred to win your heart with her beauty; and so Isabel, who was instinctively prepared for the reverse, suffered a vague disappointment, for a little instant, as she looked along the verge from the water that caressed the shore at her feet before it flung itself down, to the wooded point that divides the American from the Canadian Fall, beyond which showed dimly through its veil of golden and silver mists the emerald wall of the great Horse-Shoe. "How still it is!" she said, amidst the roar that shook the ground under their feet and made the leaves tremble overhead, and "How lonesome!" amidst the people lounging and sauntering about in every direction among the trees. In fact that prodigious presence does make a solitude and silence round every spirit worthy to perceive it, and it gives a kind of dignity to all its belongings, so that the rocks and pebbles in the water's edge, and the weeds and grasses that nod above it, have a value far beyond that of such common things elsewhere. In all the aspects of Niagara there seems a grave simplicity, which is perhaps a reflection of the spectator's soul for once utterly dismantled of affectation and convention. In the vulgar reaction from this, you are of course as trivial, if you like, at Niagara, as anywhere.

. . . . . .

. . . Emerging into the light again, she found herself at the foot of the fall by whose top she had just stood.

At first she was glad there were other people down there, as if she and Basil were not enough to bear it alone, and she could almost have spoken to the two hopelessly pretty brides, with parasols and impertinent little boots, whom their attendant husbands were helping over the sharp and slippery rocks, so bare beyond the spray, so green and mossy with the fall of mist. But in another breath she forgot them, as she looked on that dizzied

sea, hurling itself from the high summit in huge white knots, and breaks and masses, and plunging into the gulf beside her, while it sent continually up a strong voice of lamentation, and crawled away in vast eddies, with somehow a look of human terror, bewilderment and pain. It was bathed in snowy vapor to its crest, but now and then heavy currents of air drew this aside, and they saw the outline of the Falls almost as far as the Canada side. They remembered afterwards how they were able to make use of but one sense at a time, and how when they strove to take in the forms of the descending flood, they ceased to hear it; but as soon as they released their eyes from this service, every fibre in them vibrated to the sound, and the spectacle dissolved away in it. They were aware, too, of a strange capriciousness in their senses, and of a tendency of each to palter with the things perceived. The eye could no longer take truthful note of quality, and now beheld the tumbling deluge as a Gothic wall of carven marble, white, motionless, and now as a fall of lightest snow, with movement in all its atoms, and scarce so much cohesion as would hold them together; and again they could not discern if this course were from above or from beneath, whether the water rose from the abyss or dropped from the height. The ear could give the brain no assurance of the sound that filled it, and whether it were great or little; the prevailing softness of the cataract's tone seemed so much opposed to ideas of prodigious force or of prodigious volume. It was only when the sight, so idle in its own behalf, came to the aid of the other sense, and showed them the mute movement of each other's lips, that they dimly appreciated the depth of sound that involved them. . . .

1871 Howells

Over the river, so still with its oily eddies and delicate wreaths of foam, just below the Falls they have in late years woven a web of wire high in air and hung a bridge from precipice to precipice. Of all the bridges made with hands it seems the lightest, most ethereal; it is ideally graceful, and droops from its slight towers like a garland. It is worthy to command, as it does, the whole grandeur of Niagara, and to show the traveller the vast spectacle,

1871
Howells

from the beginning of the American Fall to the farthest limit of the Horse-Shoe, with all the awful pomp of the rapids, the solemn darkness of the wooded islands, the mystery of the vaporous gulf, the indomitable wildness of the shores, as far as the eye can reach up or down the fatal stream.

. . . . .

The last hues of sunset lingered in the mists that sprung from the base of the Falls with a mournful, tremulous grace, and a movement weird as the play of the northern lights. They were touched with the most delicate purples and crimsons, that darkened to deep red, and then faded from them at a second look, and they flew upward, swiftly upward, like troops of pale, transparent ghosts; while a perfectly clear radiance, better than any other for local color, dwelt upon the scene. Far under the bridge the river smoothly swam, the undercurrents forever unfolding themselves upon the surface with a vast rose-like evolution, edged all around with faint lines of white, where the air that filled the water freed itself in foam. What had been clear green on the face of the cataract was here more like rich verd-antique, and had a look of firmness almost like that of the stone itself. So it showed beneath the bridge, and down the river till the curving shores hid it. These, springing abruptly from the water's brink, and shagged with pine and cedar, displayed the tender verdure of grass and bushes intermingled with the dark evergreens that climb from ledge to ledge, till they point their speary tops above the crest of bluffs. In front, where tumbled rocks and expanses of naked clay varied the gloomier and gayer green, sprung those spectral mists; and through them loomed out, in its manifold majesty, Niagara, with the seemingly immovable white Gothic screen of the American Fall, and the green massive curve of the Horse-Shoe, solid and simple and calm as an Egyptian wall; while behind this, with their white and black expanses broken by dark foliaged little isles, the steep Canadian rapids billowed down between their heavily wooded shores.

. . . . .

The next morning they went out as they had planned, for an exploration of Goat Island, after an early breakfast. . . . 1871 Howells

. . . . .

On the bridge, they paused and looked up and down the rapids rushing down the slope in all their wild variety, with the white crests of breaking surf, the dark massiveness of heavy-climbing waves, the fleet, smooth sweep of currents over broad shelves of sunken rock, the dizzy swirl and suck of whirlpools.

Spell-bound, the journeyers pored upon the deathful course beneath their feet, gave a shudder to the horror of being cast upon it, and then hurried over the bridge to the island, in the shadow of whose wildness they sought refuge from the sight and sound.

There had been rain in the night; the air was full of forest fragrance, and the low, sweet voice of twittering birds.

. . . . .

Goat Island is marvelously wild for a place visited by so many thousands every year. The shrubbery and undergrowth remain unravaged, and form a deceitful privacy, in which, even at that early hour of the day, they met many other pairs.

. . . . .

Our friends returned by the shore of the Canadian rapids, having traversed the island by a path through the heart of the woods, and now drew slowly near the Falls again. All parts of the prodigious pageant have an eternal novelty, and they beheld the ever-varying effect of that constant sublimity with the sense of discoverers, or rather of people whose great fortune it is to see the marvel in its beginning, and new from the creating hand. The morning hour lent its sunny charm to this illusion, while in the cavernous precipices of the shores, dark with evergreens, a mystery as of primeval night seemed to linger. There was a wild fluttering of their nerves, a rapture with an under-consciousness of pain, the exaltation of peril and escape, when they came to the three little isles that extend from Goat Island, one beyond

1871
Howells

another far out into the furious channel. Three pretty suspension bridges connect them now with the larger island, and under each of these flounders a huge rapid, and hurls itself away to mingle with the ruin of the fall. The Three Sisters are mere fragments of wilderness, clumps of vine-tangled woods, planted upon masses of rock; but they are part of the fascination of Niagara which no one resists; . . .

. . . . .

. . . he . . . went alone to the top of the audacious little structure standing on the verge of the cataract, between the smooth curve of the Horse-Shoe and the sculptured front of the Central Fall, with the stormy sea of the Rapids behind, and the river, dim seen through the mists, crawling away between its lofty bluffs before. He knew again the awful delight with which so long ago he had watched the changes in the beauty of the Canadian Fall as it hung a mass of translucent green from the brink, and a pearly white seemed to crawl up from the abyss, and penetrate all its substance to the very crest, and then suddenly vanished from it, and perpetually renewed the same effect. The mystery of the rising vapors veiled the gulf into which the cataract swooped; the sun shone, and a rainbow dreamed upon them.

. . . . .

After dinner they drove on the Canada shore up past the Clifton House, towards the Burning Spring, which is not the least wonder of Niagara. As each bubble breaks upon the troubled surface, and yields its flash of infernal flame and its whiff of sulphurous stench, it seems hardly strange that the Neutral Nation should have revered the cataract as a demon; and another subtle spell (not to be broken even by the business-like composure of the man who shows off the hell-broth) is added to those successive sorceries by which Niagara gradually changes from a thing of beauty to a thing of terror. By all odds, too, the most tremendous view of the Falls is afforded by the point on this drive whence you look down upon the Horse-Shoe, and behold its three

massive walls of sea rounding and sweeping into the gulf together, the color gone, and the smooth brink showing black and ridgy. 1871 Howells

. . . . .

But all troubles passed with the night, and the next morning they spent a charming hour about Prospect Point, and in sauntering over Goat Island, somewhat daintily tasting the flavors of the place on whose wonders they had so hungrily and indiscriminately feasted at first. They had already the feeling of veteran visitors, and they loftily marveled at the greed with which newer-comers plunged at the sensations. They could not conceive why people should want to descend the inclined railway to the foot of the American Fall; they smiled at the idea of going up Terrapin Tower; they derided the vulgar daring of those who went out upon the Three Weird Sisters; for some whom they saw about to go down the Biddle Stairs to the Cave of the Winds, they had no words to express their contempt.

Then they made their excursion to the Whirlpool, mistakenly going down on the American side, for it is much better seen from the other, though seen from any point it is the most impressive feature of the whole prodigious spectacle of Niagara.

Here within the compass of a mile, those inland seas of the North, Superior, Huron, Michigan, Erie, and the multitude of smaller lakes, all pour their floods, where they swirl in dreadful vortices, with resistless under-currents boiling beneath the surface of that mighty eddy. Abruptly from this scene of secret power, so different from the thunderous splendors of the cataract itself, rise lofty cliffs on every side, to a height of two hundred feet, clothed from the water's edge almost to their crests with dark cedars. Noiselessly, so far as your senses perceive, the lakes steal out of the whirlpool, then, drunk and wild, with brawling rapids roar away to Ontario through the narrow channel of the river. Awful as the scene is, you stand so far above it that you do not know the half of its terribleness; for those waters that look so smooth are great ridges and rings, forced, by the impulse of the currents, twelve feet higher in the centre than at the margin.

1871
Howells

Nothing can live there, and with what is caught in its hold, the maelstrom plays for days, and whirls and tosses round and round in its toils, with a sad, maniacal patience. The guides tell ghastly stories, which even their telling does not wholly rob of ghastliness, about the bodies of drowned men carried into the whirlpool and made to enact upon its dizzy surges a travesty of life, apparently floating there at their pleasure, diving and frolicking amid the waves, or frantically struggling to escape from the death that has long since befallen them.

On the American side, not far below the railway suspension bridge, is an elevator more than a hundred and eighty feet high, which is meant to let people down to the shore below, and to give a view of the rapids on their own level.

. . . . .

. . . . at last they stood upon a huge fragment of stone right abreast of the rapids. Yet it was a magnificent sight, and for a moment none of them were sorry to have come. The surges did not look like the gigantic ripples on a river's course as they were, but like a procession of ocean billows; they arose far aloft in vast bulks of clear green, and broke heavily into foam at the crest. Great blocks and shapeless fragments of rock strewed the margin of the awful torrent; gloomy walls of dark stone rose naked from these, bearded here and there with cedar, and everywhere frowning with shaggy brows of evergreen. The place is inexpressibly lonely and dreadful, and one feels like an alien presence there, or as if he had intruded upon some mood or haunt of Nature in which she had a right to be forever alone. The slight, impudent structure of the elevator rises through the solitude, like a thing that merits ruin, yet it is better than something more elaborate, for it looks temporary, and since there must be an elevator, it is well to have it of the most transitory aspect. Some such quality of rude impermanence consoles you for the presence of most improvements by which you enjoy Niagara; the suspen-

sion bridges for their part being saved from offensiveness by their beauty and unreality. 1871 Howells

. . . . . .

. . . "We come to Niagara in the patronizing spirit in which we approach everything nowadays, and for a few hours we have it our own way, and pay our little tributes of admiration with as much complacency as we feel in acknowledging the existence of the Supreme Being. But after a while we are aware of some potent influence undermining our self-satisfaction; we begin to conjecture that the great cataract does not exist by virtue of our approval, and to feel that it will not cease when we go away. The second day makes us its abject slaves, and on the third we want to fly from it in terror. I believe some people stay for weeks, however, and hordes of them have written odes to Niagara."

. . . . . .

. . . The moon which is elsewhere so often of wormwood, or of the ordinary green cheese at the best, is of lucent honey there from the first of June to the last of October; and this is a great charm in Niagara. I think with tenderness of all the lives that have opened so fairly there; the hopes that have regained in the glad young hearts; the measureless tide of joy that ebbs and flows with the arriving and departing trains. Elsewhere there are carking cares of business and of fashion, there are age, and sorrow, and heartbreak; but here only youth, faith, rapture. I kiss my hand to Niagara for that reason, and would I were a poet for a quarter of an hour.

PALACIO, DON VICENTE RIVA *and* MATEOS, DON JUAN A. La cataracta del Niagara. (*In their* Dramatic works. Mexico City. 1871.) 1871 Palacio and Mateos

The time of this drama, written in verse, is 1847. The first two acts are set in Mexico City, and the third at Niagara.

1872

BIDDLE, HORACE P. Niagara. (*In his* Poems. N. Y.: Riverside Press. 1872. P. 237.) 1872 Biddle

1872 Biddle

A sonnet addressed to "Almighty God" who

Here, by these waters, in their ceaseless flow,
Has fixed His covenant. Behold the Bow!
And while earth trembles 'neath the mighty load,
Man sees the promise and the power of God!

1872 Ridgely

RIDGELY, A. S. (Poem) (*In* Holley, G. W., Niagara; its history and geology, incidents and poetry. . . . N. Y., Buffalo, Toronto. 1872. Pp. 164–165.)

Man lays his sceptre on the ocean waste,
His foot-prints stiffen in the Alpine snows,
But only God moves visibly in Thee,
Oh King of Floods! that with resistless fate
Down plungest in thy mighty width and depth.
. . . Amazement, terror, fill,
Impress and overcome the gazer's soul.
Man's schemes and dreams and petty littleness
Lie open and revealed. Himself far less —
Kneeling before thy great confessional —
Than are bubbles of the passing tides.
Words may not picture thee, nor pencil paint
Thy might of waters, volumed vast and deep;
Thy many-toned and all pervading voice;
Thy wood-crown'd Isle, fast anchor'd on the brink
Of the dread precipice; thy double stream,
Divided, yet in beauty unimpaired;
Thy wat'ry caverns and thy crystal walls;
Thy crest of sunlight and thy depths of shade,
Boiling and seething like a Phlegethon
Amid the wind-swept and convolving spray,
Steady as Faith and beautiful as Hope.
There, of beam and cloud the fair creation,
The rainbow arches its ethereal hues.
From flint and granite in compacture strong;
Not with steel thrice harden'd — but with the wave
Soft and translucent — did the new-born Time

Chisel thy altars. Here hast thou ever poured 1872
Earth's grand libation to Eternity, Ridgely
Thy misty incense rising unto God —
The God that was and is and is to be.

Thoughts on visiting Niagara. (*In* Holley, G. W., Niagara; its history and geology, incidents and poetry. . . . N. Y., Buffalo, Toronto. 1872. Pp. 157–158.) 1872

I wonder how long you've been a roarin'
At this infernal rate;
I wonder if all you've been a pourin'
Could be ciphered on a slate.

I wonder how such a thund'rin' sounded
When all New York was woods;
I suppose some Indians have been drownded
When rains have raised your floods.

I wonder if wild stags and buffaloes
Hav'nt stood where now I stand;
Well, 'spose — bein' scared at first — they stub'd their toes,
I wonder where they'd land!

I wonder if the rainbow's been a shinin'
Since sunrise at creation;
And this water-fall been underminin'
With constant spateration!

That Moses never mentioned ye, I've wondered,
While other things describin'.
My conscience! how loud you must have thunder'd
While the deluge was subsidin'!

My thoughts are strange, magnificent and deep,
While I look down on thee.
Oh! what a splendid place for washing sheep
Niagara would be!

1872 And oh! what a tremendous water power
Is wasted o'er its edge!
One man might furnish all the world with flour
With a single privilege.

I wonder how many times the lakes have all
Been emptied over here?
Why Clinton didn't feed the Grand Canawl
From hence, I think is queer.

1872 Tupper

TUPPER, MARTIN FARQUHAR. Niagara. (*In* Holley, George W., Niagara; its history and geology, incidents and poetry. . . . N. Y., Buffalo, Toronto. 1872. P. 163.)

By the author of *Tupper's Proverbial Philosophy.*

I longed for Andes; all around and Alps,
Hoar kings and priests of Nature robed in snow,
Throned as for judgment in a solemn row,
With icy mitres on their giant scalps,
Dumb giants frowning at the strife below.

I longed for the sublime. Thou art too fair,
Too fair, Niagara, to be *sublime!*
In calm, slow strength thy mighty floods do flow
And stand a cliff of Cataracts in the air,
Yet all too beauteous, Water bride of Time!

Veiled in soft mists and cinctured by the bow,
Thy pastoral charms may fascinate the sight,
But have not power to set my soul aglow,
Raptured by fear and wonder and delight.

1873

1873 Taylor

TAYLOR, BAYARD. The chiropodist; a story of the watering places—III—Niagara. (Harp. w., 1873. 24:465–466.)

Niagara used as the background for the happy denouement of a love story.

1874

WINES, MARY J. Niagara Falls. (*In her* Infant harper and other poems. Cambridge, Mass.: Hurd & Houghton. 1874. P. 193.) 1874 Wines

Great God! within Thy glorious temple, mute with awe,
We stand and listen to the pealing hymn
Of thine Omnipotence. In all this wide, wide world
Where can earth's children go to learn a grander lesson
Of Thy Majesty? . . .

Doubt must vanish, boasting cease, weariness and sorrow find rest and comfort, in this spectacle, is the spirit of the poem.

1875

[MORETON, *Mrs.* C. J.] Niagara above the cataract. (*In her* Miscellaneous poems. . . . [Phila.:] Porter and Coates. 1875. Pp. 165–169.) 1875 Moreton

Premonition of the battling flood at the fall makes the heart leap fast as the traveller approaches the scene.

[MORETON, *Mrs.* C. J.] Niagara below the cataract. (*In her* Miscellaneous poems. . . . [Phila.:] Porter and Coates. 1875. Pp. 165–169.)

The Falls are compared to a temple

. . . a fitting place
For solemn thought, for deep and earnest prayer;
For here the finger of our God I trace,
Beneath, above, around me, everywhere;
He hollowed out this grand and mighty nave,
And robed his altar with the ocean wave!

1876

CARPIO, MANUEL. Soneto a la Catarata del Niagara. (*In* Poesias de Manuel Carpio con su biografia escrita por el Sr. Doctor Jose Bernardo Conto. Nuova edicion. Veracruz-Pueblo: Liberias La Ilustracion. Paris: A. Donnametti. 1883. P. 206.) 1876 Carpio

El ancho rio avázase rugiente
Entre selvas que cubren la llanura,
Vastas regiones llenas de frescura

1876
Carpio

Va regando su esplendida corriente
Pero sus grandes aguas de repente
Se precipitan de una immensa altura
Yse guebrantan en la roca dura,
Yse trasforman en espuma hirviente.

Al estruendoso golpe, espera nube
Alla se agita en el profundo seno
Y vagarosa del abismo sube.
Tiembla y retiembla el bárbaro terreno
Y ante Dios arrodillase el querube
Alando oye cerca el incansable trueno.

1876
Warner

WARNER, SUSAN. The rapids of Niagara. N. Y.: R. Carter and Brothers. 1876. P. 211.

This "highly moral tale" is volume six in Miss Warner's Say and Do series. The characters are brought to Niagara, and the book contains a full-page view of the Falls.

1877

1877
Prieto

PRIETO, GUILLERMO. Viaje a los Estados-Unidos. Por Fidel. 3 vols. Mexico: Dublan y Chavez. 1878. 2:285–312.

The author's visit to Niagara was made in 1877. He gives us a poetic prose description of the Falls and the feelings and reflections inspired by them, and also two poems on Niagara: *En El Niagara* and *Al Niagara.*

1878

1878
Bennett

BENNETT, W. C. Snatched from Niagara. (Belgravia. Midsummer holiday no. 1878. Pp. 90–97.)

Story of the rescue of a man who drifted down into the rapids while fishing. He leaped on a rock as his boat passed, and was finally saved by a boat let down on cables in tow of a canoe. A graphic and well-written tale.

1878
Day

DAY, RICHARD E. Niagara. (*In his* Lines in the sand. [Poems.] Syracuse, N. Y.: John T. Roberts. 1878. Pp. 28–30.)

1879

1879
Longfellow

LONGFELLOW, HENRY W. Poems of places. Boston: James R. Osgood and Co. 1876–1879. 27:152–167.

Vol. 27, America, Middle States.—Contains a selection of well-known poems relating to Niagara, as follows: **1879** Longfellow

The falls of Niagara.....J. G. C. Brainard
Niagara .....J. M. Heredia
Niagara Falls .....Lord Morpeth
Niagara .....H. H. Brownell
Niagara .....Anonymous
Niagara .....T. G. Appleton
Niagara .....L. H. Sigourney
Avery .....W. D. Howells
Goat Island.....T. G. Appleton
The Cataract Isle.....C. P. Cranch

————. Niagara. (*In* Longfellow, H. W., Poems of places. Boston: James R. Osgood and Co. 27:158–159.) **1879**

I stood within a vision's spell;
I saw, I heard. The liquid thunder
Went pouring to its foaming hell
And it fell,
Ever, ever fell
Into the invisible abyss that opened under.

I stood upon a speck of ground;
Before me fell a stormy ocean.
I was like a captive bound;
And around
A universe of sound
Troubled the heavens with ever-quivering motion.

Down, down forever — down, down forever,
Something falling, falling, falling,
Up, up forever — up, up forever.
Resting never,
Boiling up forever,
Steam-clouds shot up with thunder-bursts appalling.

1879
Longfellow

A tone that since the birth of man
Was never for a moment broken,
A word that since the world began,
And waters ran,
Hath spoken still to man,—
Of God and of Eternity hath spoken.

. . . . .

And in that vision, as it passed,
Was gathered terror, beauty, power;
And still, when all has fled, too fast,
And I at last
Dream of the dreamy past,
My heart is full when lingering on that hour.

Anonymous.

1880–1881

1880–81
Smith

SMITH, ERMINNIE A. A Seneca legend of Hi-nu^{n} and Niagara. (*In her* Myths of the Iroquois. Pp. 54–55.) (Sec. ann. rep't of the bureau of ethn. to the sec'y. of the Smith. inst. 1880–81. By J. W. Powell, Director. Wash.: Gov't. print. off. 1883.)

A beautiful Indian maiden was about to be compelled by her family to marry a hideous old Indian.

Despair was in her heart. She knew that there was no escape for her, so in desperation she leaped into her canoe and pushed it from shore on the roaring waters of Niagara. She heeded not that she was going to her death, preferring the angry waters to the arms of her detested lover.

Now, the God of Cloud and Rain, the great deity Hi-nu^{n}, who watches over the harvest, dwelt in a cave behind the rushing waters. From his home he saw the desperate launching of the maiden's canoe; saw her going to almost certain destruction. He spread out his wings and flew to her rescue, and caught her just as her frail bark was dashing on the rocks below.

The grateful Indian girl lived for many weeks in Hi-nu^{n}'s cave. He taught her many new things. She learned from him why her people died so often — why sickness was always busy

VIEW OF NIAGARA

From a photograph taken in the seventies

among them. He told her how a snake lay coiled up under the ground beneath the village, and how he crept out and poisoned the springs, because he lived upon human beings and craved their flesh more and more, so that he could never get enough if they died from natural causes. 1880–81 Smith

Hi-nuⁿ kept the maiden in til he learned that the ugly old suitor was dead. Then he bade her return and tell her tribe what she had learned of the great Hi-nuⁿ.

She taught them all he had told her and begged them to break up their settlement and travel nearer to the lake; and her words prevailed. For a while sickness ceased, but it broke out again, for the serpent was far too cunning to be so easily outwitted. He dragged himself slowly but surely after the people, and but for Hi-nuⁿ's influence would have undermined the new settlement as he had the former one. Hi-nuⁿ watched him until he neared the creek, then he launched a thunderbolt at him. A terrible noise awoke all the dwellers by the lake, but the snake was only injured, not killed. Hi-nuⁿ was forced to launch another thunderbolt, and another and another, before, finally, the poisoner was slain.

The great dead snake was so enormous that when the Indians laid his body out in death it stretched over more than twenty arrow flights, and as he floated down the waters of Niagara it was as if a mountain appeared above them. His corpse was too large to pass the rocks, so it became wedged in between them and the waters rose over it mountains high. As the weight of the monster pressed on the rocks they gave way and thus the horseshoe form, that remains to this day, was fashioned. But the Indians had no more fever in their settlement.

The same legend is given with additional details in Morgan, Lewis H., *League of the Ho-De-No-San-Nee, or Iroquois*, page 158, published by Lage & Bro. at Rochester, 1851.

1881

COLES, ABRAHAM. A Sabbath at Niagara. (*In his* The microcosm and other poems. N. Y.: D. Appleton and Co. 1881. Pp. 226–235.) 1881 Coles

1881
Coles

Forevermore, from thee, Niagara!
Religious Cataract! Most Holy Fane!
A service and a symphony go up
Into the ear of God. 'Tis Sabbath morn.
My soul, refreshed and full of comfort, hears
Thy welcome call to worship. . . .

. . . . .

My soul, that else were mute, transported finds
In you, O inarticulate Harmonies!
Expression for unutterable thoughts,
Surpassing the impertinence of words.

. . . . .

She makes
Of this immense significance of sound,
Sublime appropriation, chanting it anew,
As her " Te Deum," and sweet Hymn of Laud.

This ends the introduction.

Is God not here?
The thunder utters, Yes!
The trembling rocks in fear
The truth confess;
The assenting mountains nod,
And all things round
Echo one sound,
All testify of God.
O, let my soul exult,
That here she may consult,
The Oracle Divine!
That at Jerusalem, no more,
Is fixed as heretofore
Jehovah's Shrine!
That ancient ritual is past,
That Temple to the ground is cast,
Those symbols and those semblances sublime,

Endured but for a time. 1881
Their everlasting prototypes, I ween, Coles
Their patterns on the Mount by Moses seen,
Were these, are here!
This much, at least is clear;
If, in th' immensity of space,
God makes one spot his special dwelling-place,
That sacred spot is this.
I find the witness and the sign,
Authentic, marvelous, divine,
Here in th' ebullient, luminous abyss,
Where thousand suns once bright,
So seems, now back exhausted pour
Their full collected light,
In ceaseless flood for evermore.

All through this exalted poem, the author feels himself nothingness and dust. In an ecstasy he describes his going to the cataract, and the temptation that assails him to leap down. Musing on his homeward walk he finds that the scales have fallen from his eyes, and he sees God in all the common things.

Music of Niagara. (Scrib. mo., June, 1881. 22:307–308.) 1881

Two letters to the editor criticising the statements and opinions of Mr. Thayer, as expressed in his article in Scribner's Monthly for February, 1881, on the Music of Niagara. With these letters is published Mr. Thayer's reply to the criticisms.

PALMER, B. FRANK. Apostrophe to Niagara. (*In* Porter, Peter A., Official guide. Niagara Falls, river, frontier. . . . Buffalo: The Matthews Northrup Works. 1901. Pp. 289–290.) 1881 Palmer

This is Jehovah's fullest organ strain!
I hear the liquid music rolling, breaking,
From the gigantic pipes the great refrain
Bursts on my ravished ear, high thoughts awaking!

The low sub-bass, uprising from the deep
Swells the great paean as it rolls supernal —

1881
Palmer

Anon, I hear, at one majestic sweep
The diapason of the keys eternal.

Standing. beneath Niagara's angry flood —
The thundering cataract above me bounding —
I hear the echo: "Man, there is a God!"
From the great arches of the gorge resounding.

Behold, O man, nor shrink aghast in fear!
Survey the vortex boiling deep before thee!
The Hand that ope'd the liquid gateway here
Hath set the beauteous bow of promise o'er thee!

Here, in the hollow of that Mighty Hand,
Which holds the basin of the tidal ocean,
Let not the jarring of the spray-washed strand
Disturb the orisons of pure devotion.

Roll on, Niagara! Great River King!
Beneath thy sceptre all earth's rulers, mortal,
Bow reverently; and bards shall ever sing
The matchless grandeur of thy peerless portal!

I hear, Niagara, in this grand strain
His voice, who speaks in flood, in flame, and thunder —
Forever, mayst thou, singing, roll and reign —
Earth's grand, sublime, supreme, supernal wonder.

1881
Thayer

THAYER, EUGENE. Music of Niagara. (Scrib. mo., Feb. 1881. 21:583–586.)

Written from the point of view of an organist and a musician, this article deals with the musical qualities of the sound of Niagara. The pitch and composition of the tone of Niagara are described, and the different tones of the chord which the sound conveys to the musical ear are given. In the course of his experiments the author investigated the subject from Goat Island, the Cave of the Winds,—"under the singing

waters,"—from Luna Island, and from various points on both the American and Canadian side of the Falls. He says in part: 1881 Thayer

It had ever been my belief that Niagara had not been *heard* as it should be, and in this belief I eagerly turned my steps hitherward the first time a busy life would permit. What did I hear? The roar of Niagara? No. Having been everywhere about Niagara, above and below, far and near, over and under, and heard her voice in all its wondrous modulations, I must say that I have never, for a single instant, heard any *roar* of Niagara. From the first moment to the last, I heard nothing but a perfectly constructed musical tone — clear, definite and unapproachable in its majestic perfection; a complete series of tones, all uniting in one grand and noble unison, as in the organ, and all as easily recognizable as the notes of any great chord in music. And I believe it was my life-long familiarity with the king of instruments which enabled me to detect so readily the tone-construction of this mighty voice of the " thunder of waters."

I had been told that the pitch of this tone had been given by various persons. That were an easy task, although no two of them seem to have been entirely unanimous. I propose to give much more than this, and the reader will find not only the pitch of the chief or ground tone given, but that of all the accessory or upper tones, otherwise known as harmonic, collateral or over tones; also the beat or accent of Niagara, with its rhythmical vibrations and subdivisions, from the largest to the smallest, and all in such simple notation that any one who understands the rudiments of music may readily comprehend it. Indeed, I believe that all good readers may understand it clearly without any special technical knowledge of music to assist them.

After the more technical details are discussed the author says:

I have spoken only of the pitch and rhythm of Niagara. What is the *quality* of its tone? Divine! There is no other word for a tone made and fashioned by the Infinite God. I repeat, there is no *roar* at all — it is the sublimest music on earth.

1882

1882
Houghton

HOUGHTON, GEORGE W. Niagara. (*In his* Niagara, and other poems. Bost.: Houghton Mifflin. 1882. Pp. 1–28.)

Begins with the creation of Niagara and deals with a pilgrim who journeys to Niagara to seek an answer to the riddle of life. He goes to the rapids, the Falls, and the whirlpool each in turn but without result. Finally a little bird brings in song the message

"Seek within, without is only reflection."

In the course of the poem the rapids, cataract, the gorge, and whirlpool are all described.

THE CATARACT

Still to thy Fall I come near, as unto earth's grandest cathedral,
Forehead uncovered, hands down, with feet that falter beneath me;
Hearing afar, o'er the rustling grass and the rush of the river;
Chorus triumphant, thy trumpet voice, and I tremble with weakness.

Tall above tower and tree looms thy steeple builded of sunshine,
Mystical steeple, white like a cloud, unyearning toward heaven,
Till into cloud-land it drifts, uprolling in hill-tops and headlands,
Catches the glory of sunset, then pales into rose-tint and purple.

Slowly, through gothic aisles, I creep to the steps of thine altar,
Halfway forgetting thy presence, though still with each step I draw nearer,
Halfway forgetting thy voice, so far it sends fancy awandering
Till, with a sudden ascent, full-face thou standest before me.

Who, upon tiptoes straining, shall snare the fleet course of the comet!
Who in bright pigments shall match the luminous sun-god at mid-day!
Who shall dare picture in words the turbulent wrath of the tempest!
Seeing, I can but stand still, with finger on lip, and keep silent.

M. K.: Shooting the Falls. (Macmill., Nov. 1882. 47:42–47.) **1882**

A tale of a fisherman rescued after having gone over the Falls and brought to life long enough to tell his story. M. K.

1883

BONALDI, JUAN ANTONIO PAREZ. El poema del Niagara. 2d. ed. N. Y.: 1883. **1883** Bonaldi

HOWELLS, WILLIAM DEAN. Niagara revisited, twelve years after their wedding journey. (Atlan., May, 1883. 51:598–610.) **1883** Howells

"An interesting and amusing story of a second visit to Niagara."

RICE, ROSWELL. The Falls of Niagara. (*In his* Orations and poems. Springfield: 1883. Pp. 645–646.) **1883** Rice

A poem with a moral based on the inevitable destruction awaiting those who drift down stream.

Shooting Niagara Falls. (Critic, Jan. 1883. 100:122–127.) **1883**

A tale of an Italian fisherman who was caught in the rapids and carried over the Falls. According to the story, he was rescued and lived long enough to relate his experiences.

Shooting Niagara Falls. (Eclec. mag., Jan. 1883. n. s. 37:122–127.) **1883**

1884

LORNE, JOHN GEORGE EDWARD HENRY DOUGLAS SUTHERLAND CAMPBELL, *Marquis of*. Niagara. (*In his* Memories of Canada and Scotland; speeches and verses. Montreal: Dawson Brothers. 1884. P. 60.) **1884** Lorne

A ceaseless, awful, falling sea, whose sound
  Shakes earth and air, and whose resistless stroke
  Shoots high the volleying foam like cannon smoke!
How dread and beautiful the floods, when, crowned
By moonbeams on their rushing ridge, they bound
  Into the darkness and the veiling spray;
  Or, jewel-hued and rainbow-dyed, when day
Lights the pale torture of the gulf profound!

So poured the avenging streams upon the world
  When swung the ark upon the deluge wave,

1884
Lorne

And, o'er each precipice in grandeur hurled,
The endless torrents gave mankind a grave.
God's voice is mighty, on the water loud,
Here, as of old, in thunder, glory, cloud!

1884
Owahyah

OWAHYAH. Birch bark legends of Niagara, founded on traditions among the Iroquois, or Six nations: a story of the lunar-bow, which brilliantly adorns Niagara Falls by moonlight; or Origin of the totem of the wolf. St. Cath., Ont.: Jour. Printing Co. 1884.

Another version of the story of the sacrifice to Manitou at the Falls. This is a thrilling tale of love, revenge, and divine interposition, ending, finally, in the marriage of the hero and heroine and the death of the villain.

1885

1885
Gilbert

GILBERT, HOWARD WORCESTER. Niagara. (*In his* Aldornere and two other Pennsylvania idylls. . . . Bost.: Index Ass'n. 1885. Pp. 87–88.)

A description of Niagara in the morning,—the mists, the rainbow, the play of colors, and the avalanche of water falling into the abyss.

1885

———————. Goat Island, Niagara. (*In* Rhine, Alice Hyneman, Niagara park illustrated. . . . N. Y.: Niagara Pub. Co. 1885. c. P. 77.)

Nature here in royal mood
Built herself a pleasaunce wood;
Built it on a frowning scaur
High as mountain summits are,
And around it made to flow
Seas that fall in deeps below.

Near where waters fiercest sweep,
Bade she blue-ey'd gentians creep;
Ferns spring up from mossy beds,
Snow-white daisies lift their heads,
Briar rose and golden rod
Set she thick in grassy sod.

Then her sovereign taste to please 1885
Planted out great forest trees;
Titians crown'd with myriad leaves
Flaunting to the sun and breeze,
Rooted them as in some scene,
Quiet valleys roll between.

And her fancy to complete
In this favorite wonder-seat,
Stole she rainbows from the skies,
Bright with heav'ns resplendent dyes,
Arched them o'er the raging fall
Watch to keep above them all.

This poem is not found in the edition of 1888, published by Wm. T. Hunter.

————————. Niagara by moonlight. (*In* Rhine, Alice Hyneman ed., Niagara park illustrated. . . . N. Y.: Niagara Pub. Co. 1885. c. P. 60.) 1885

Fair above all is Niagara by night,
When the pale moon drawn from the silent sky
Meets with the thund'ring waters, as they fly
Over the precipice's dizzy height;
Making them seem a mass of silver light.
A molten silver sea that thunders by,
In pomp as great, and equal majesty
As once the ancient deluge in its might
Rush'd onwards; spilling over mountain chain,
Plunging from scaur to bottomless abyss
Whence tortur'd waves leapt up in spray and rain,
Perhaps the moon fell on, as now on this;
Mellowing the grandeur of the stormy main
To scene of peace and perfect loveliness.

This poem is not included in the 1888 edition of this book of Alice Hyneman Rhine's published by Wm. T. Hunter.

1886

1886 Cowdin

COWDIN, JASPER BARNETT. Ripple brook, Niagara Falls; two poems. Brooklyn, N. Y.: 1886. P. 7.

Solemnly, slowly, the vast weight of falling
Waters the voice of a spirit immortal
Drowns,— and he stands, as at Heaven's great portal,
Humbled in sight of his low earthly calling.
Man hath no glory here;
Watching in silence thy soul-waking wonder,
O Niagara! — hearing thy thunder,
Pride must not come near.

There are fourteen verses in the spirit of this opening verse.

1886 Lowry

LOWRY, AUGUSTUS N. Niagara. Revised edition. (1886 c.)

Written for publication in the proceedings at the dedication of the Niagara Reservation, July 15, 1885.

1886 Marston

[MARSTON, FRANK.] Frank's ranche. . . . Bost.: Houghton Mifflin. 1886. Pp. 76–81.

The author makes no attempt at description. By his own account he did only what is usual. If we may believe him, he and his party "were glad to get away from Niagara and its army of vampires."

1886 Warner

WARNER, CHARLES DUDLEY. Their pilgrimage. N. Y.: Harper Brothers. 1897. Pp. 300–315.

A most sympathetic study of the Falls with descriptions of their appearance at night and in the early morning, and an account of Goat Island and the Cave of the Winds. Used as a background for the story, these pages descriptive of the Falls are full of beauty of expression and thought.

It was dark when they came into the station at Niagara — dark and silent. Our American tourists, who were accustomed to the clamor of hackmen here, and expected to be assaulted by a horde of wild Comanches in plain clothes, and torn limb from baggage, if not limb from limb, were unable to account for this silence, and the absence of the common highwaymen, until they remembered that the State had bought the Falls, and the agents of

the government had suppressed many of the old nuisances. It was possible now to hear the roar of the cataract. 1886 Warner

This unaccustomed human stillness was ominous to King. He would have welcomed a Niagara of importunity and imprecations; he was bursting with impatience to express himself; it seemed as if he would die if he were silent an hour longer under that letter. Of course the usual American relief of irritability and impatience suggested itself. He would telegraph; only electricity was quick enough and fiery enough for his mood. But what should he telegraph? The telegraph was not invented for love-making, and is not adapted to it. It is ridiculous to make love by wire. How was it possible to frame a message that should be commercial on its face, and yet convey the deepest agony and devotion of the sender's heart? King stood at the little telegraph window, looking at the dispatcher who was to send it, and thought of this. Depressed and intent as he was, the whimsicality of the situation struck him. What could he say? It illustrates our sheeplike habit of expressing ourselves in the familiar phrase or popular slang of the day that at the instant the only thing King could think of to send was this: "Hold the fort, for I am coming." The incongruity of this made him smile, and he did not write it. Finally he composed this message, which seemed to him to have a businesslike and innocent aspect: "Too late. Impossible for me to change. Have invested everything. Expect letter." Mechanically he counted the words when he had written this. On the fair presumption that the company would send "everything" as one word, there were still two more than the conventional ten, and from force of habit he struck out the words "for me." But he had no sooner done this than he felt a sense of shame. It was contemptible for a man in love to count his words, and it was intolerable to be haggling with himself at such a crisis over the expense of a dispatch. He got cold over the thought that Irene might also count them, and see that the cost of this message of passion had been calculated. And with reckless-

1886
Warner

ness he added: "We reach the Profile House next week, and I am sure I can convince you that I am right."

King found Niagara pitched to the key of his lacerated and tumultuous feelings. There were few people at the Cataract House, and either the bridal season had not set in, or in America a bride has been evolved who does not show any consciousness of her new position. In his present mood the place seemed deserted, the figures of the few visitors gliding about as in a dream, as if they too had been subdued by the recent commission which had silenced the drivers, and stopped the mills, and made the park free, and was tearing down the presumptuous structures along the bank. In this silence, which emphasized the quaking of the earth and air, there was a sense of unknown, impending disaster. It was not to be borne indoors, and the two friends went out into the night.

On the edge of the rapids, above the hotel, the old bath-house was in process of demolition, its shaking piazza almost overhanging the flood. Not much could be seen from it, but it was in the midst of an elemental uproar. Some electric lamps shining through the trees made high lights on the crests of the rapids, while the others near were in shadow and dark. The black mass of Goat Island appeared under the lightning flashes in the northwest sky, and whenever these quick gleams pierced the gloom the frail bridge to the island was outlined for a moment, and then vanished as if it had been swept away, and there could only be seen sparks of light in the houses on the Canadian shore, which seemed very near. In this unknown, which was rather felt than seen, there was a sense of power and of mystery which overcame the mind; and in the black night the roar, the cruel haste of the rapids, tossing white gleams and hurrying to the fatal plunge, begat a sort of terror in the spectators. It was a power implacable, vengeful, not to be measured. They strolled down to Prospect Park. The gate was closed; it had been the scene of an awful tragedy but a few minutes before. They did not know it, but they knew that the air shuddered, and as they

skirted the grounds along the way to the foot-bridge the roar grew in their stunned ears. There, projected out into the night, were the cables of steel holding the frail platform over the abyss of night and terror. Beyond was Canada. There was light enough in the sky to reveal, but not to dissipate, the appalling insecurity. What an impious thing it seemed to them, this trembling structure across the chasm! They advanced upon it. There were gleams on the mill cascades below, and on the mass of the American Fall. Below, down in the gloom, were patches of foam, slowly circling around in the eddy — no haste now, just sullen and black satisfaction in the awful tragedy of the fall. The whole was vague, fearful. Always the roar, the shuddering of the air. I think that a man placed on this bridge at night, and ignorant of the cause of the aerial agitation and the wild uproar, could almost lose his reason in the panic of the scene. 1886 Warner

They walked on; they set foot on Her Majesty's dominions; they entered the Clifton House — quite American, you know, with its new bar and office. A subdued air about everybody here also, and the same quaking, shivering, and impending sense of irresponsible force. Even " two fingers," said the artist, standing at the bar, had little effect in allaying the impression of terror out there. When they returned the moon was coming up, rising and struggling and making its way slowly through ragged masses of colored clouds. The river could be plainly seen now, smooth, deep, treacherous; the falls on the American side showed fitfully like patches of light and foam; the Horseshoe, mostly hidden by a cold silver mist, occasionally loomed up a white and ghostly mass. They stood for a long time looking down at the foot of the American Fall, the moon now showing clearly the plunge of the heavy column — a column as stiff as if it were melted silver — hushed and frightened by the weird and appalling scene. They did not know at that moment that there where their eyes were riveted, there at the base of the fall, a man's body was churning about, plunged down and cast up, and beaten and whirled, imprisoned in the refluent eddy. But a body was there. In the

1886
Warner

morning a man's overcoat was found on the parapet at the angle of the fall. Some one then remembered that in the evening, just before the park gate closed, he had seen a man approach the angle of the wall where the overcoat was found. The man was never seen after that. Night first, and then the hungry water, swallowed him. One pictures the fearful leap into the dark, the midway repentance, perhaps, the despair of the plunge. A body cast in here is likely to tarry for days, eddying round and round, and tossed in that terrible maelstrom, before a chance current ejects it, and sends it down the fierce rapids below. King went back to the hotel in a terror of the place, which did not leave him so long as he remained. His room quivered, the roar filled all the air. Is not life real and terrible enough, he asked himself, but that brides must cast this experience also into their honeymoon?

The morning light did not efface the impressions of the night, the dominating presence of a gigantic, pitiless force, a blind passion of nature, uncontrolled and uncontrollable. Shut the windows and lock the door, you could not shut out the terror of it. The town did not seem safe; the bridges, the buildings on the edge of the precipices with their shaking casements, the islands, might at any moment be engulfed and disappear. It was a thing to flee from.

I suspect King was in a very sensitive mood; the world seemed for the moment devoid of human sympathy, and the savageness and turmoil played upon his bare nerves. The artist himself shrank from contact with this overpowering display, and said that he could not endure more than a day or two of it. It needed all the sunshine in the face of Miss Lamont and the serenity of her cheerful nature to make the situation tolerable, and even her sprightliness was somewhat subdued. It was a day of big, broken, high-sailing clouds, with a deep blue sky and strong sunlight. The slight bridge to Goat Island appeared more presumptuous by daylight, and the sharp slope of the rapids above it gave a new sense of the impetuosity of the torrent. As they

walked slowly on, past the now abandoned paper-mills and the other human impertinences, the elemental turmoil increased, and they seemed entering a world the foundations of which were broken up. This must have been a good deal a matter of impression, for other parties of sight-seers were coming and going, apparently unawed, and intent simply on visiting every point spoken of in the guide-book, and probably unconscious of the all-pervading terror. But King could not escape it, even in the throng descending and ascending the stairway to Luna Island. Standing upon the platform at the top, he realized for the first time the immense might of the downpour of the American Fall, and noted the pale green color, with here and there a violet tone, and the white cloud mass spurting out from the solid color. On the foam-crested river lay a rainbow forming nearly a complete circle. The little steamer *Maid of the Mist* was coming up, riding the waves, dashed here and there by conflicting currents, but resolutely streaming on — such is the audacity of man — and poking her venturesome nose into the boiling foam under the Horseshoe. On the deck are pigmy passengers in oil-skin suits, clumsy figures, like arctic explorers. The boat tosses about like a chip, it hesitates and quivers, and then, slowly swinging, darts away down the current, fleeing from the wrath of the waters, and pursued by the angry roar. 1886 Warner

Surely it is an island of magic, unsubstantial, liable to go adrift and plunge into the cañon. Even in the forest path, where the great tree trunks assure one of stability and long immunity, this feeling cannot be shaken off. Our party descended the winding staircase in the tower, and walked on the shelf under the mighty ledge to the entrance of the Cave of the Winds. The curtain of water covering this entrance was blown back and forth by the wind, now leaving the platform dry and now deluging it. A woman in the pathway was beckoning frantically and calling to a man who stood on the platform, entirely unconscious of danger, looking up to the green curtain and down into the boiling mist. It was Mrs. Stubbs; but she was shouting against Niagara,

1886
Warner

and her husband mistook her pantomime for gestures of wonder and admiration. Some moments passed, and then the curtain swung in, and tons of water drenched the Englishman, and for an instant hid him from sight. Then, as the curtain swung back, he was seen clinging to the handrail, sputtering and astonished at such treatment. He came up the bank dripping, and declaring that it was extraordinary, most extraordinary, but he wouldn't have missed it for the world. From this platform one looks down the narrow, slippery stairs that are lost in the boiling mist, and wonders at the daring that built these steps down into that hell, and carried the frail walk of planks over the bowlders outside the fall. A party in oil-skins, making their way there, looked like lost men and women in a Dante Inferno. The turbulent waters dashed all about them; the mist occasionally wrapped them from sight; they clung to the rails, they tried to speak to each other; their gestures seemed motions of despair. Could that be Eurydice whom the rough guide was tenderly dragging out of the hell of waters, up the stony path, that singular figure in oil-skin trousers, who disclosed a pretty face inside her hood as she emerged? One might venture into the infernal regions to rescue such a woman; but why take her there? The group of adventurers stopped a moment on the platform, with the opening into the misty cavern for a background, and the artist said that the picture was, beyond all power of the pencil, strange and fantastic. There is nothing, after all, that the human race will not dare for a new sensation.

The walk around Goat Island is probably unsurpassed in the world for wonder and beauty. The Americans have every reason to be satisfied with their share of the fall; they get nowhere one single grand view like that from the Canada side, but infinitely the deepest impression of majesty and power is obtained on Goat Island. There the spectator is in the midst of the war of nature. From the point over the Horseshoe Fall our friends, speaking not much, but more and more deeply moved, strolled

along in the lovely forest, in a rural solemnity, in a local calm, almost a seclusion, except for the ever-present shuddering roar in the air. On the shore above the Horseshoe they first comprehended the breadth, the great sweep, of the rapids. The white crests of the waves in the west were coming out from under a black, lowering sky; all the foreground was in bright sunlight, dancing, sparkling, leaping, hurrying on, converging to the angle where the water becomes a deep emerald at the break and plunge. The rapids above are a series of shelves, bristling with jutting rocks and lodged trunks of trees, and the wildness of the scene is intensified by the ragged fringe of evergreens on the opposite shore. 1886 Warner

Over the whole island the mist, rising from the caldron, drifts in spray when the wind is favorable; but on this day the forest was bright and cheerful, and as the strollers went farther away from the Great Fall, the beauty of the scene began to steal away its terror. The roar was still dominant, but far off and softened, and did not crush the ear. The triple islands, the Three Sisters, in their picturesque wildness appeared like playful freaks of nature in a momentary relaxation of the savage mood. Here is the finest view of the river; to one standing on the outermost island the great flood seems tumbling out of the sky. They continued along the bank of the river. The shallow stream races by headlong, but close to the edge are numerous eddies, and places where one might step in and not be swept away. At length they reached the point where the river divides, and the water stands for an instant almost still, hesitating whether to take the Canadian or American plunge. Out a little way from the shore the waves leap and tumble, and the two currents are like race-horses parted on two ways to the goal. Just at this point the water swirls and lingers, having lost all its fierceness and haste, and spreads itself out placidly, dimpling in the sun. It may be a treacherous pause, this water may be as cruel as that which rages below and exults in catching a boat or a man and bounding with

1886
Warner

the victim over the cataract; but the calm was very grateful to the stunned and buffeted visitors; upon their jarred nerves it was like the peace of God.

. . . . .

The relief from the dread of Niagara felt at this point of peace was only temporary. The dread returned when the party approached again the turmoil of the American Fall, and fell again under the influence of the merciless haste of the flood. And there every islet, every rock, every point, has its legend of terror; here a boat lodged with a man in it, and after a day and night of vain attempts to rescue him, thousands of people saw him take the frightful leap, throwing up his arms as he went over; here a young woman slipped, and was instantly whirled away out of life; and from that point more than one dazed or frantic visitor had taken the suicidal leap. Death was so near here and so easy!

One seems in less personal peril on the Canadian side, and has more the feeling of a spectator, and less that of a participant in the wild uproar. Perhaps there is more sense of force, but the majesty of the scene is relieved by a hundred shifting effects of light and color. In the afternoon, under a broken sky, the rapids above the Horseshoe reminded one of the seashore on a very stormy day. Impeded by the rocks, the flood hesitated and even ran back, as if reluctant to take the final plunge! The sienna color of the water on the table contrasted sharply with the emerald at the break of the fall. A rainbow springing out of the centre of the caldron arched clear over the American cataract, and was one moment bright and the next dimly seen through the mist, which boiled up out of the foam of waters and swayed in the wind. Through this veil darted adventurous birds, flashing their wings in the prismatic colors, and circling about as if fascinated by the awful rush and thunder. With the shifting wind and the passing clouds the scene was in perpetual change; now the American Fall was creamy white, and the mist below dark, and again the heavy mass was gray and sullen, and the mist like

silver spray. Perhaps nowhere else in the world is the force of nature so overpowering to the mind, and as the eye wanders from the chaos of the fall to the far horizon, where the vast rivers of rapids are poured out of the sky, one feels that this force is inexhaustible and eternal. 1886 Warner

If our travellers expected to escape the impression they were under by driving down to the rapids and whirlpool below, they were mistaken. Nowhere is the river so terrible as where it rushes, as if maddened by its narrow bondage, through the cañon. Flung down the precipice and forced into this contracted space, it fumes and tosses and rages with vindictive fury, driving on in a passion that has almost a human quality in it. Restrained by the walls of stone from being destructive, it seems to rave at its own impotence, and when it reaches the whirlpool it is like a hungry animal, returning and licking the shore for the prey it has missed. But it has not always wanted a prey. Now and again it has a wreck or a dead body to toss and fling about. Although it does not need the human element of disaster to make this cañon grewsome, the keepers of the show places make the most of the late Captain Webb. So vivid were their narratives that our sympathetic party felt his presence continually, saw the strong swimmer tossed like a chip, saw him throw up his hands, saw the agony in his face at the spot where he was last seen. There are several places where he disappeared, each vouched for by creditable witnesses, so that the horror of the scene is multiplied for the tourist. The late afternoon had turned gray and cold, and dashes of rain fell as our party descended to the whirlpool. As they looked over the heaped-up and foaming waters in this eddy they almost expected to see Captain Webb or the suicide of the night before circling round in the maelstrom. They came up out of the gorge silent, and drove back to the hotel full of nervous apprehension.

King found no telegram from Irene, and the place seemed to him intolerable. The artist was quite ready to go on in the morning; indeed, the whole party, although they said it was

1886 Warner

unreasonable, confessed that they were almost afraid to stay longer; the roar, the trembling, the pervading sense of a blind force and rage, inspired a nameless dread. The artist said, the next morning at the station, that he understood the feelings of Lot.

1886 Warner

WARNER, CHARLES DUDLEY. Their pilgrimage. (Harp., Oct., 1886. 76:677.)

1887

1887 Bodenstedt

BODENSTEDT, FREDERICK. Niagara. (*In* Ott, Adolph *and* Palmer, Hans, Nordamerika. Vereinigte Staaten von Amerika. . . . Bern. Rydegger und Baumgart. 1887. P. 503.)

In addition to this quotation from Bodenstedt, the three pages immediately preceding contain information concerning railroad, hotels, history and scenery of Niagara Falls.

Nie erschien mir ein Strombild an Wundern so reich,
So sturmisch im Wechsel, doch immer sich gleich
In bezaubernder Macht urgewaltigen Seins
Und hehrer Gebilde des Schalles und Scheins.
Trüb war der Himmel, als ich zuerst dich sah,
In deiner wilden Grösse, Niagara,
Und die Sonne war schon im Unteregh'n,
Als ich kam, dich zum letzen Male zu seh'n.
Und du hiessest mich selbst tief hinuntersteigen,
Um dich mir in voller Grösse zu zeigen.
Im tiefen, gewundenen Felsenbette.
Dich umragt keine schimmernde Bergeskette,
Deine Ufer sind flach und öde ganz,
Doch do brauchst keines prangenden Rahmens Glanz:
Deine eigene Gult, deiner Wellen Klang
Wird mir leuchten und klingen mein Leben lang.

BODENSTEDT, FREDERICK. Niagara. (*See* Michigan Central Railroad Company, From city to surf. . . . Chicago: Rand, McNally. 1888. Pp. 67–68.)

CHARLES, EMILY THORNTON. An address to the body of a man in the whirlpool. Niagara. (*In her* Lyrical poems. Phila.: Lippincott. 1887. Pp. 110–111.) 1887 Charles

Not a great poem, but written in an interesting and buoyant style.

1888

FRECHETTE, LOUIS. Le Niagara. (*See* Michigan Central Railroad Company, From city to surf. . . . Chicago: Rand, McNally, 1888. P. 63.) 1888 Frechette

1889

SLADEN, DOUGLAS BROOKE WHEELTON. To the American fall at Niagara (*In* Sladen, Douglas, ed., Younger American poets 1830–1890. . . . With an appendix of Younger Canadian poets; ed. by G. B. Roberts. Lond. and Sydney: Griffith, Farran, Okeden and Welsh. 1891. Dedicatory sonnet.) 1889 Sladen

This sonnet is dated Niagara, October 18, 1889.

Niagara, national emblem! Cataract
Born of the maddened rapids, sweeping down
Direct, resistless from the abyss's crown
Into the deep, fierce pool with vast impact
Scarce broken by the giant boulders, stacked
To meet thine onslaught, threatening to drown
Each tillaged plain, each level-loving town
'Twixt thee and ocean. Lo! the type exact!

America Niagarized the world.
Europe, a hundred years agone, beheld
An avalanche, like pent-up Erie, hurled
Through barriers, to which the rocks of eld
Seemed toy things — leaping into godlike space.
A sign and wonder to the human race.

YOUNG, *Mrs.* JULIA DITTO. Adrift: a story of Niagara. Phila.: Lippincott. 1889. 1889 Young

A tale of a summer flirtation.

1890

1890 Chandler — CHANDLER, HENRY. The nymph of Niagara gorge. Buffalo: 1890.

A poor attempt at poetry in seven eight-line stanzas. The scene is laid at Foster Flats.

1891

1891 Dexter — DEXTER, CHARLES. Niagara. (*In his* In memoriam, versions and idle measures. Cincinnati: Robert Clarke & Co. 1891. P. 186–191.)

A little love story with Erie, Niagara, and Ontario as *dramatis personae.*

1891 Imrie — IMRIE, JOHN. Niagara Falls. (*In his* Songs and miscellaneous poems. Toronto: Imrie and Graham. 1891. Pp. 26–28.)

Eight stanzas religious and patriotic in tone.

1892

1892 Van Duzee — VAN DUZEE, L. D. Niagara. (*In his* By the Atlantic, later poems. Bost.: Lee and Shepard. 1892. Pp. 247–250.)

Another poet who saw the hand of God in the Falls and in their presence felt the insignificance of man.

1892 Williams — WILLIAMS, ESPY. Niagara. (*In his* Dream of art, and other poems. N. Y.: Putnam. 1892. P. 70.)

Before — the bright green waters
In listless madness fly,
Leap shouting smoothly downward,
Mount mistful, white to sky.

Above — the bright sun shining,
Kisses the dancing spray,
Till smiling it blushes all colors
And in gladness melts away.

O heart! with your tireless torrent
Of doubt, and cataract fears,
Love's sunshine still kisses to blushes,
And scatters your mist and tears.

1893

BEGG, MARY MILLAR. Niagara. (*In her* My mother's marriage ring and other poems. Glasgow: Bryce. 1893. P. 100.) **1893 Begg**

Two stanzas addressed to the "majestic torrent" and "overpowering force" of Niagara.

LOVEMAN, ROBERT. Niagara. (*In his* Poems. Tuscaloosa: Burton. 1893. P. 17.) **1893 Loveman**

Some vast despair, some grief divine,
  Doth vigil keep,
Forever here; Before this shrine
  The waters weep.

Methinks a God from some far sphere,
  In sportive part,
In ages past wooed Nature here,
  And broke her heart.

1894

BAKER, NAAMAN R. An ode to Niagara. (*In his* Constancy and other poems. Mt. Morris. 1894. P. 48.) **1894 Baker**

A brief poem dealing with the short span of man's life as compared with the everlastingness of Niagara.

COMMELIA, ANNA OLCOTT. Niagara. (*In her* Of such is the kingdom, and other poems. N. Y.: Fowler and Wells. 1894. Pp. 17–20.) **1894 Commelia**

Addressed to Niagara as the marvel, monarch, pride, and wonder of the West.

GILDER, RICHARD WATSON. At Niagara. (*In his* Poems. Bost. & N. Y.: Houghton, Mifflin & Co. 1908. Pp. 215–216.) **1894 Gilder**

I

There at the chasm's edge behold her lean
Trembling as, 'neath the charm,
A wild bird lifts no wing to 'scape from harm;
Her very soul drawn to the glittering, green,

1894
Gilder

Smooth, lustrous, awful, lovely curve of peril;
While far below the bending sea of beryl
Thunder and tumult — whence a billowy spray
Enclouds the day.

II

What dream is hers? No dream hath wrought that spell!
The long waves rise and sink;
Pity that virgin soul on passion's brink,
Confronting Fate — swift, unescapable,—
Fate, which of nature is the intent and core,
And dark and strong as the steep river's pour,
Cruel as love, and wild as love's first kiss!
Ah, God! the abyss.

1894
H. E. J.

H. E. J. "A poem of the elements," an appreciation of Niagara: August, 1891. (Critic, Sept. 22, 1894. 25:181.)

A critic of Niagara descriptions. The author found noble dignity and repose but nothing of awe, terror, desolation, or death in the Falls. The deafening roar did not exist for him. In his own words, "the fullest and most buoyant life, the sprightliest animation, the gayest colors and the loudest song—these are the language of that poem of the elements we call Niagara."

1894
McCann & Saltus

McCann, John Earnest *and* Saltus, Francis S. Niagara. (McClure, Oct., 1894. 3:436.)

A short poem, written in 1888 and reprinted by special request. Has real literary merit.

Since the first dawn, thro' vague and unknown ways,
Between the icy north and where I fall,
From lands beyond the pole, from where brooks call,
And sing responsive to the cold birds' lays,
I glide, I leap, I bound, thro' nights and days;
I rush, I rave, I roar, and I appall —
Ay! to the very heights of heaven's wall —
The hosts that reverential glances raise.

And puny men who walk the earth ne'er dream 1894
Of the great force beneath my glassy face; McCann & Saltus
And, so, from my brown bed up to the sod,
I seem in all my majesty supreme
Defying time and earth, and fate and space,
To be the tumult of the tears of God!

TRUMBULL, WILLIAM. The legend of the white canoe. N. Y. and Lond.: Putnam. 1894. 1894 Trumbull

A story told in verse of the ancient Indian custom among the tribes in the vicinity of Niagara, of a sacrifice to the Spirit of the Falls. In a white birch-bark canoe was sent over the Falls the fairest maiden of the tribe, surrounded by ripe fruits and blooming flowers. The sacrifice was supposed to propitiate the Spirit of the Falls and gain for the tribe prosperity and abundant crops.

PROEM.

Mid the rush of mighty waters, in the thundering cataract's roar,
Where Niagara's streaming rapids down in headlong torrent pour;
When the serried waves like chargers madly leaping to the fray,
Fling aloft their snowy crests and toss their manes of flying spray,
Rearing, plunging, onward urging — Nature's glorious cavalry!
Where the eternal sweep of waters like the unending surge of time,
Pulsing, throbs in rhythmic measure to a wondrous strain sublime:
Dwells, so ancient legends say, the mighty Spirit of the Falls,
Who, from out the tumult, hoarsely, for unbounded homage calls.
Here the children of the forest, spellbound by that deafening roar,
Stopped to gaze with listening wonder, in the simpler days of yore;
Awe-struck, gazed in silent worship, well beseeming Nature's child,
As in chase they roamed the plain, or tracked in war the pathless wild;
And as often as they listened, on the voices of the flood
Deep were borne the Spirit's mutterings, calling fierce for human blood;
Ay, and sacrifice more cruel in that cry, they understood:
Gift of Nature's choicest treasure, peerless budding womanhood!

1895

1895 Allis

ALLIS, ALMON TRASK. Uncle Alvin at Niagara. (*In his* Uncle Alvin at home and abroad. Hornellsville. 1895. Pp. 112–134.)

Uncle Alvin and Nancy Jane take a day off for an excursion trip to Niagara. The poem consists of descriptions of and reflections on sights and scenes at Niagara in pleasant vein.

1895 Thomson

THOMSON, EDWARD WILLIAM. John Bedell, United States loyalist. (*In his* Old Man Savarin and other stories. N. Y. and Boston: T. Y. Crowell & Co. (c. 1895.) Pp. 251–270.)

The scene of this story of love and death is laid at the Falls. A father gives his life to save his daughter and her lover.

1895 Young

YOUNG, DAVID. Historical facts and thrilling incidents of the Niagara frontier. Niagara Falls, N. Y.: (1895.)

Among others are the accounts of the hermit, Webb, the Maid of the Mist, and the poem of Avery.

1896

1896 Scanlan

SCANLAN, WALLACE. "Dirty": a story of Niagara. (The reminder. Lockport, N. Y.: August, 1896. 1:1.)

A story of an unknown wronged man who heroically gives up his life to save the woman who had deserted him, from going over the Falls.

1896 Tabb

TABB, JOHN B. Niagara. (Atlantic, Sept., 1896. 78:403.)

A little poem — thoughts suggested by Niagara.

1896 Thayer

THAYER, EUGENE. Music of Niagara. (Sci. Am. sup., Mar. 7, 1896. 41:16837.)

A brief extract reprinted from the *Trinity Record.*

1898

1898 Johnson

JOHNSON, RICHARD LEWIS. Apostrophe to Niagara. (*In his* Niagara; its history, incidents and poetry. . . . Wash.: Neale. 1898. Pp. 35–41.)

Cyclopean torrent, this thy throne,
Which man but yesterday hath known,
Through all thy countless ages flown,
Creation's masterpiece.

1898
Johnson

How wonderful and vast thou art!
Grand Pantheon of Omniscient art!
Thy flood-gates demonstrate thou art
"Without a parallel!"

Awe-struck I hear the passing crowd
Of heaving storm waves thundering loud,
And see them writing here the proud
Grand Autograph of God.

A thousand waves on dress parade
Urge on the crowding cavalcade,
Which pauses on the brink, afraid
The awful plunge to take.

See yon gigantic wave command
The myriad troopers, as they stand
Erect, with flashing sword in hand,
To charge the host below!

Adown they charge, that mighty force,
Resistless in its downward course;
The rider and the foaming horse —
Brigade Victorious!

. . . . .

Thy grand facade, with curtains down,
Presents no monster's ugly frown,
But like a maiden's bridal gown,
A robe of beauty is.

Its elevation reaches high,
And fain would touch the changing sky,
Its falling waters ever cry,
Rejoicing as they leap.

1898
Johnson

Majestic fleets that float their flags,
And brave Old Ocean's rocky crags,
Dare not approach our rugged snags,
Nor Titian-fashioned front.

Some noble bards have done their best
To praise Mt. Etna's blazing crest,
Yet, we could flood the monarch's nest
And crop his golden curls,

And challenge heaven's bright sentry stars
To find beneath his lavic bars
A spark, to light their gilded cars,
Before the blaze of morn.

. . . . .

Primeval tribes no more shall roam
Thy banks to pitch their tented home,
Whose fairest daughters made thy foam
Their willing sepulchre.

For here they gathered once a year,
With festive dance and savage cheer,
And sacrificed, without a tear,
The fairest of the tribe.

Thy organ notes with thunderous roar,
Sound thy Creator's lofty score
Of Love and Mercy evermore,
In grand diapason.

Beyond this temple vast and dim,
Methinks thy anthem, psalm, or hymn,
Floods in sweet melody to Him
Who waits the grand Amen!

. . . . .

1898
Johnson

Sheets of sunfire blaze and quiver
On thy waves, O boistrous river,
As they leap to foam and shiver,
Adown this gulf of death!

Deep undercurrents night and day,
An everlasting power display,
Exhaustless, unconfined, they play,
Unfathomed, unrestrained.

Take in the sight around — about,
And know, Vain Man! beyond a doubt,
God's power is here past finding out —
Eternal mystery.

Oft have I sat, in quiet hour,
Beside this emblem of God's power,
And fancied Eden's sacred bower
No symbol had like this.

Emotionful our souls should know
He placed that graceful radiant bow
To span the hurricane below,
In token of His love.

Thou Sacrilegious Man — go hence!
How futile is thy vain pretence
To scoff and doubt Omnipotence,
Arrayed in glory here!

. . . . .

Ere Cheop's Pyramidal pile
Stood reared upon the classic Nile,
Was cut thy rough, rock-ribbed defile
By ante-glacial flood!

1898
Johnson

From yonder tower view Queenston's height,
Hennepin was denied the sight,
From whence thou struggled in the night
Of primeval dawn.

The windings of thy crystal shoe,
Church faithfully portrayed, 'tis true,
The canvas shows a bygone view.
Pride of the "Corcoran."

. . . . .

When Winter steps upon the stage,
White-cowled and solemn as a sage,
Thou dost display an ample page
Of glistening ice-moss bright.

Then icy apples moonlit shine
On evergreens at midnight time,
And then thou seemest most sublime,
In snowy satin robed.

Translucent columns, purest white,
Glisten in the morning light;
Prismatic scene of rare delight,
Of hues Elysian;

Here snow-capped mountains block thy flow,
While crystal diamonds crown the show,
And icy bridges form below,
To span a Paradise.

. . . . .

The flower is pledged unto the bee,
The tidal wave unto the sea;
Our northern floods are pledged to thee,
Thou thundering watersheet!

Natural Condition of Prospect Point about 1875

And yet, O Thunderer, what art thou
To Him with iridescent brow,
Who guides thy grand retreating prow,
The whispers of His might;

And notches on these walls of stone
His hieroglyphics, yet thine own,
To make thy soundless ages known.
Through glyptic monographs.

Who wrote his name, " The Unseen God,"
In burning letters, fiery shod,
On Terrapin Tower, once trod
By bold adventurers;

When lo! 'twas hurled from heaven to hell,
The tottering, grand old sentinel,
Where oft I went to view the well,
Above thy plunging floods.

. . . . .

God gave thee queenly sisters three,
Faith, Hope and glorious Charity,
And placed the Iris Isle to be
A brooch to pin thy veil.

He sent the morn with rustling wings,
And filled the vales with babbling springs,
And gave the birds their color'd wings
And sweetly charming notes,

To praise thy cascades most sublime,
Thro' every land, thro' every clime,
Whose opalescent rainbows shine
To prove his promise true.

1898
Johnson

He heaved the snow-clad mountains up,
To fill old Erie's vine-clad cup,
With waters sweet for thee to sup,
Majestic Orator!

He listeth in thy cave sublime,
And speaketh in that voice of thine,
And rideth on the storms of Time,
Which lash the Island's home.

A spectacle personified,
May here be seen at midnight tide;
And lovers with the greatest pride
May view a modest beau.

He courts the Queen of Night by day,
At ev'n song he tints the spray;
At peep of dawn he fades away —
The opal lunar bow.

For the lost Eden, search no more,
In myth or prehistoric lore;
That question's settled, ever more,
On this the Sacred Isle,

Whose ferns and mosses scent the breeze,
Where east and west each soul agrees,
The Tigris and the Euphrates
Flow swiftly, gladly on.

How bright and grand to thee did seem
This world arrayed in living green,
While Luna, robed in silvery sheen,
Her nightly vigils kept,

1898
Johnson

With gleaming light and lunar bow,
Thy phantom flood of joy and woe,
A milky stream of ceaseless flow,
A phosphorescent dream;

'Till paler man, with selfish soul,
Held in his hand a parchment scroll,
And taxed his neighbors, ev'ry soul —
Infinite Oracle!

Who came to list thy voice so true,
And view thy waters, green and blue,
And marvel at thy emerald shoe
Whose hoof an empire is!

Seated on the "Rock of Ages,"
While musing o'er the sacred pages,
Indited by inspir'd sages,
I heard a spirit say:

Let lions roar and people sing,
And eagles flutter on the wing,
While all the bells in steeples ring
For thee, Niagara.

A jubilation loud and grand,
From frigid zones to torrid strand,
For Dufferin ope'd, with lordly hand,
Thy flood-gates free.

Now may thy incense heavenward soar,
And thy tempestuous billows roar
Their solemn protests, o'er and o'er
Thy crest, Niagara.

1898
Johnson

'Till Justice, with concordant hand,
And Liberty with outstretched hand,
Shall welcome pilgrims as they land
On Freedom's happy shore.

And guard with zealous care for aye,
Thy mighty organ, night and day,
That all the world may hear it play,
With unvexed harmony.

Until discordant war's alarms,
And conflicts of contending arms,
Are silenced by thy mad'ning charms,
Plunge on, Niagara!

Nor let thy eyelids ever close,
In Neptune's arms in sweet repose,
'Till all the nations shall disclose,
Like thee, Niagara,

A charity as broad and deep
As is thine own encircling steep,
Or as thy vortex where we peep
Thro' azure mists to heaven.

. . . . .

Methinks the Grecian bard would find
Meet inspiration for his noblest song.
And not in Trojan wars;
For here dwells Liberty.

While myriad sunlit, liquid pearls 1898
Obscure thy bubbling pools and whirls, Johnson
Our Goddess stoops, with golden curls,
To sip thy hydromel.

Proud Bedloe's Isle may sound her horn —
Bartholdi's gift her coast adorn;
But till her birthday's final morn,
Here dwelleth Liberty.

In search of gain and worldly pelf,
The robber here hath shown himself,
And like the ox amid the delf,
He would his figure break.

Let press and voice at once condemn
The spoiler who would steal a gem
From off the glittering diadem
Of this majestic stream.

Though " Hope's bright star " is sometimes pale,
Let Hope, not Fear, in man prevail,
The misty Ghost within the veil
Proves life's resurrection.

Alas! Niagara, what are we
Frail creatures when compared to thee?
Yet, what art thou to Deity? —
But insignificance.

MEISTER, WILHELM. Creation's pride. (*In* Johnson, R. L., Niagara its history, incidents, and poetry. Wash.: W. Neale. 1898. P. 55.) 1898 Meister

Niagara's canon, swept by waters grand!
No gorge like thine, nor depths, the mighty hand
Of time hath wrought.

1898
Meister

Thy cataract stupendous is, and fierce;
No human voice or sound can ever pierce
Its deaf'ning roar.

Thy seething currents rend with awful might
Great rocks, that nature in chaotic might
Did rear on high.

A whirlpool deep within thy walls doth hiss,
And raging 'round, sinks down in dark abyss
To unknown depths.

Around Ontario's blue and wide domain,
No mountains check, nor lofty barriers chain,
Thine outlet vast.

In the great ocean's infinite expanse
Thy volumes rest, and with their powers, enhance
The vasty deep.

These verses are from the pen of a German poet, who signs himself Wilhelm Meister.

1898
Severance

SEVERANCE, FRANK HAYWARD. Niagara and the poets. (*In his* Old trails on the Niagara frontier. 1st ed. Buffalo: 1899. 2d ed. Cleveland: 1903. Pp. 221–260.)

1898
Porter

PORTER, PETER A. [Lines in a young lady's album.] (*In* Johnson, R. L., Niagara, its history, incidents and poetry. Wash.: W. Neale. 1898. Pp. 49–50.)

Written by Colonel Porter in a young lady's album, in which he also drew a sketch representing the Falls in the distance with Father Hennepin, La Salle, and an Indian chief in the foreground. The touch of humor in the verses is very pleasant.

An artist, underneath his sign (a masterpiece, of course)
Had written, to prevent mistakes, "This represents a horse";
So ere I send my Album Sketch, lest connoisseurs should err,
I think it well my Pen should be my Art's interpreter.

A chieftain of the Iroquois, clad in a bison's skin, 1898
Had led two travelers through the wood, La Salle and Porter
Hennepin.
He points, and there they, standing, gaze upon the ceaseless
flow
Of waters falling as they fell two hundred years ago.

Those three are gone, and little heed our worldly gain or
loss —
The Chief, the Soldier of the Sword, the Soldier of the
Cross.
One died in battle, one in bed, and one by secret foe;
But the waters fall as once they fell two hundred years ago.

Ah, me! what myriads of men, since then, have come and
gone;
What states have risen and decayed, what prizes lost and
won;
What varied tricks the juggler, Time, has played with all
below;
But the waters fall as once they fell two hundred years ago.

What troops of tourists have encamped upon the river's
brink;
What poets shed from countless quills, Niagaras of ink;
What artist armies tried to fix the evanescent bow
Of waters falling as they fell two hundred years ago.

. . . . .

And stately inns feed scores of guests from well replenished
larder,
And hackmen drive their horses hard, but drive a bargain
harder;
And screaming locomotives rush in anguish to and fro:
And the waters fall as once they fell two hundred years ago.

1898
Porter

And brides of every age and clime frequent the island's bower,
And gaze from off the stone-built porch — hence called the Bridal Tower —
And many a lunar belle goes forth to meet a lunar beau,
By the waters falling as they fell two hundred years ago.

And bridges bind thy breast, O stream! and buzzing mill-wheels turn,
To show, like Samson, thou art forced thy daily bread to earn;
And steamers splash thy milk-white waves, exulting as they go,
But the waters fall as once they fell two hundred years ago.

Thy banks no longer are the same that early travelers found them,
But break and crumble now and then like other banks around them;
And on the verge our life sweeps on — alternate joy and woe
But the waters fall as once they fell two hundred years ago.

Thus phantoms of a by-gone age have melted like the spray;
And in our turn we too shall pass, the phantoms of today:
But the armies of the coming time shall watch the ceaseless flow
Of waters falling as they fell two hundred years ago.

1898
Ridgely

RIDGELY, A. S. (Poem.) (*In* Johnson, R. L., Niagara, its history, incidents and poetry. Wash.: W. Neale. 1898. Pp. 54–55.)

This poem also appears in Holley's "Niagara; its history and geology, incidents and poetry," published in 1872 and has been already quoted earlier in this chapter.

1898
Wendell

WENDELL, HARVEY. Niagara in winter. (Leslie's w., Mar. 24, 1898. 86:186.)

A descriptive poem of Niagara "a frozen poem."

1899

ZANGWILL, ISRAEL. Noah's ark. (*In his* They that walk in darkness. N. Y.: Macmillan Co. 1899.) **1899 Zangwill**

In this story, which was also published in Lippincott's in August, 1899, is a fairly accurate account of Major Mordecai Manuel Noah's proposed plan for a City of Refuge for Jews on Grand Island.

1900

AUSTIN, HENRY. Niagara. (Indep., Nov. 29, 1900. 52:2827.) **1900 Austin**

Splendor supreme of constant majesty,
Of towering passion, overpowering charm,
At last, mine eyes behold thee as thou art —
In all the lightness of thy moving grace;
In all the whiteness of thy soaring spray;
In all the brightness of thy might!

At last,
Mine ears drink in thy voice miraculous,
O plunging mountain full of thunder-songs
Defiant or triumphant, echoing aye
Through vasts of day and night!

O Shape beyond
All wingéd imagery of magic words
Most musical, by ancient bards bequeathed
To spell the hearts of ever-coming men,
At last, I grasp, I clasp thee; and my soul,
Struck speechless in thy Cavern of the Winds,
Breathlessly burns with sharp, voluptuous ache
To dash herself against thy torrent breast
And join the awful Angels of thy fall
Perpetual on the crags of Agony —
Victorious Agony of glorious doom!

1900
Austin

O perilous bridge 'mid gusts of dazzling pearl,
Or where a diamond storm enshrouds the way,
Thou seem'st like Life a span 'twixt Day and Night;
For tho eternal rainbows crown the rocks,
Halos of Hope, charmed circles of high Faith,
Commanding entrance through the chasms of Doubt
To deeps of nobler knowledge and soul-strength,
Yet all this beauty overwhelms the mind
By clash of contrast with our littleness.
Alas! for Man, the Universal Dwarf,
Slave of Heredity, Waif of Circumstance,
Cringer to Custom, Toy of Temperament,
Rock-chained by Self, a vain Promethean child!
E'en in his loftiest hour, Niagara,
Facing thy vastness, Nature's most sublime
Picture and Poem, can he read a line
Or track a tint back to its hidden source
Or catch the secret meaning of one tone
'Mid the melliflous thunders which arise
Eternal from thy flowers of prismy foam;
Fadeless, though falling ever — never quite
Lost in the looming, luminous Infinite?
Hush! Let us not be shadowed or dismayed
By aught of greatness in the outer sphere,
By sense of Man's collective littleness,
Or any conscious nothingness of self!
In Life, e'en as in Art, Perfection, Size,
Is of all sizes: — and the first, firm step
In true development and lasting strength
Must ever be the brave acknowledgment
Of weakness or of lack.

So, Heart of Mine,
Oh! Heart of All, stand up and take the sun!
Seize, for 'tis thine, thy Sovereignty of Light!

Night with her pale Infinitude of Stars, **1900**
Nor Ocean, nor the Mountains, nor e'en Thou, Austin
Niagara, with all thy loveliness,
Can match, in possibilities of growth
To Power, to Beauty, to Sublimity,
That noblest mystery, the Soul of Man.

————. Niagara. (*In* Porter, P. A., Goat Island. Niagara **1900**
Falls, N. Y.: 1900.)

This poem by an unknown author appears as an introduction to the account of Goat Island. It is also found in the reprint of Mr. Porter's work in the *Sixteenth Annual Report of the Commissioners of the State Reservation at Niagara.*

Great Fall, all hail:
Canst thou unveil
The secrets of thy birth;
Unfold the page
Of each dark age,
And tell the tales of earth?

When I was born
The stars of morn
Together sang — 'twas day:
The sun unrolled
His garb of gold
And took his upward way.

He mounted high
The eastern sky
And then looked down on earth;
And she was there,
Young, fresh, and fair,
And I, and all, had birth.

Niagara Falls

1900

The word of power
Was spoke that hour:
Dark chaos felt the shock;
Forth sprung the light,
Burst day from night,
Up leaped the living rock.

Back fell the sea
The land was free,
And mountain, hill, and plain
Stood forth to view,
In emerald hue,—
Then sang the stars amain.

And I — oh thou:
Who taught me how
To hymn thy wondrous love
Deign to be near
And calm my fear,
O Holy one above.

I caught the word
Creation heard,
And by thy power arose;
His goodness gave
The swelling wave
That ever onward flows.

By his command
The rainbow spanned
My forehead and his will
Evoked the cloud
My feet to shroud,
And taught my voice to trill.

1900

And who is he
That questions me?
From whom hast thou thy form,
Thy life, thy soul?
My waters roll
Through day, night, sunshine, storm.

In grateful praise
To him, I raise
A never ceasing song
To that dread one,
To whom stars, sun,
Earth, ocean, all belong.

Thou too adore
Him ever more
Who gave thou all thou hast;
Let time gone by
In darkness die
Deep buried in the past.

And be thy mind
To him inclined
Who made earth, heaven, and thee —
Thy every thought
To worship wrought,—
This lesson learn of me.

1900
Porter

PORTER, PETER A. A legend of Goat Island ascribed to Father Louis Hennepin, who visited Niagara in 1678. . . . Niagara Falls: (1900.)

A long poem telling the story of a priest who by disproving the Indian tradition that none but warriors could reach Goat Island and live, succeeded in winning the Indian chieftain and his tribe to the true religion.

1901 Bruce

BRUCE, WALLACE. Niagara. (*In* Michigan Central R. R. Chicago: 1901. P. 33.

Proud swaying pendant of a crystal chain,
On fair Columbia's rich and bounteous breast
With beaded lakes that necklace-like retain
Heaven's stainless blue with golden sunlight blest!
What other land can boast a gem so bright!
With colors born of sun and driven spray —
A brooch of glory, amulet of might
Where all the irised beauties softly stray.
Ay, more — God's living voice, Niagara thou!
Proclaiming wide the anthem of the free;
The starry sky, the crown upon thy brow,
Thy ceaseless chant a song of Liberty.
But this thy birthright, this thy sweetest dower,
Yon arching rainbow — Love still spanning Power.

1901 Carus

CARUS, PAUL. The chief's daughter: a legend of Niagara. Chicago: c. 1901.

The legend of the last sacrifice of the Oniahgahrah Indians. According to the tale the chieftain's daughter gives herself as a sacrifice in spite of all of Hennepin's arguments. Her father follows her over the Falls. In the words of the author, the "Ruler of the Cataract" and the "Maid of the Mist" are at home in a crystalline grotto "in the unfathomable depths of the Horseshoe Falls, but on moonlight nights they visit the Three Sister Islands or the Cave of the Winds and their figures may be seen hovering over the rapids or round that beautiful white sheet of water called the Bridal Veil." The two characters mentioned are symbolical of the powerful grandeur and chaste beauty of the scene.

1901 Fulton

FULTON, *Mrs.* LINDA DE K. Nadia, the maid of the mist: a story of Niagara. Buffalo: 1901.

1901 Pritchard

PRITCHARD, MYRON T. *comp.* Poetry of Niagara. . . . Compiled by M. T. Pritchard. Bost.: Lothrop Pub. Co. (1901.)

One of the later collections of Niagara poetry from various sources, comprising 128 pages.

1902

BLANCHARD, AMY ELLA. A loyal lass, a story of the Niagara campaign of 1814. Boston & Chicago: W. A. Wilde Co. (1902.) 1902 Blanchard

In the first chapter, the scene of the story is set on the Niagara river within sound of the roar of the cataract.

SHARPE, WILLIAM. Niagara and Khandalla, and other poems. Lond.: H. A. Copley. 1902. 1902 Sharpe

Written by a retired army surgeon, who gives his general reflections on the Falls, the points of vantage for viewing Niagara, and the best season for seeing them. The poem is well-written, and its restraint is a relief after some of the more extravagant effusions.

STRATEMEYER, EDWARD. Marching on the Niagara; or, The soldier boys of the old frontier. Boston: Lee and Shepard. (Colonial series II.) 1902. 1902 Stratemeyer

In this story a battle takes place near the Falls; there is a struggle between an Indian and the white hero on the banks of the rapids, and the story of a rescue from the rapids.

1903

COOK, JOSEPH. Overtones; a book of verse. N. Y.: Knickerbocker press. 1903. Pp. 85–86. 1903 Cook

NIAGARA.

I hear the thunderous thud, the muffled roar
I see the blinding, wheeling, smiting mists,
The greens, the grays, purples and amethysts,
From Heaven's wide palm thy frightened cataracts pour,
And I look up beneath them and adore.
Above me hang chain lightnings on the wrists
Of summer tempests. In the awesome lists
Of contests are the thunders and thy shore.
Beneath thy quivering riven cliff I lie
And gaze into the lightning and the sky
But I hear only thee and touch and see
A hand which undergirds immensity.
Thou speakest much, but speaketh most of him;
God, God, God walks on thy watery rim.

1903 Saunders

SAUNDERS, J. E. Niagara. Lond.: Partridge. 1903.

A moralizing poem about

"Nature's unequalled masterpiece: —
Sublimest of sublimities."

1904

1904 Copeland

COPELAND, BENJAMIN. Niagara, and other poems. Buffalo: Matthews–Northrup. 1904. Pp. 11–12.

Majestic symbol of eternal power!
Dread oracle of sons all unknown!
Before thy presence Pomp and Passion cower,—
All men are equal at thy awful throne.

Abashed, the eager babble of the mart,—
To silence shamed, the vulgar greed for gain;
No more ambition goads the weary heart,
And Toil forgets its unrequited pain.

Stern type of Truth's inexorable law!
No room remains for envy or for pride;
Here prince and pauper stand in common awe,
Swayed by the spell of thy resistless tide.

A rushing, seething Sinai,— thou dost pour
On sluggish consciences the solemn sense
Of justice infinite: — thy thunder's roar
Declares to Wrong relentless recompense.

Against our arrogance thy strength doth plead;
Deep unto deep imperiously calls;
Impartial annalist! the nations read
Their transient glory on thy ageless walls.

Yet dost thou deign to dower the moment's need,—
Our dreams exceeding by thy bounteous sway;
With power unrivalled thy proud flood shall speed
The New World's progress toward Time's perfect day.

O mighty monitor! O seer sublime! 1904 Copeland
The soul's surpassing grandeur thou dost show; —
The fountains of thy immemorial prime
Through man's immortal being freely flow.

TWAIN, MARK. Extracts from Adam's diary translated from the original Ms. N. Y. and Lond.: Harper and Brothers, 1904. 1904 Twain

A fanciful tale, placing the creation of Man and the Garden of Eden at Niagara. There are many humorous hits on the Falls and the park management.

1905

ROHR, MATHIAS. Am Niagara. (*In his* Gedichte. München. [1905] Pp. 6–8.) 1905 Rohr

The lure of the Falls, the cave of the winds, and the mist.

ROHR, MATHIAS. Das Opfer des Niagara. (*In* his Gedichte. München. [1905] Pp. 56–59.)

The familiar Iroquois legend of the sacrifice to Niagara, but in this case the maiden is rescued by a priest and her folk converted to Christianity.

ROY, CAMILLE, *L'abbé*. Etude sur l'histoire de la litterature canadienne. 1800–1820. (Proc. and trans. of the Roy Soc. of Can. 2d ser. May, 1905. 11:127–130.) 1905 Roy

The author ascribes to J. D. Mermet, soldier and poet, the authorship of a poem entitled, "*Tableau de la Cataracte de Niagara,*" *apres la bataille du 25 juillet 1814*, which appeared in le Spectateur, May 9, 1915. The poem is quoted at some length.

N'est-ce pas encore Mermet qui a dessiné ce large et puissant tableau de la cataracte de Niagara, longue poésie souvent belle, pittoresque, précise, parfois animé du meilleur souffle et qui est bien le plus puissant effort qui ait été accompli, en ce temps-là, pour peindre la nature canadienne.

C'est après une bataille livrée près de Niagara, où les Canadiens furent vainqueurs. Nos troupes sont campées à quelque distance de la cataracte; la plus vive animation règne au

1905
Roy

milieu des soldats, et au "bruit belliqueux" l'on entend so joindre le bruit des flots mugissants. Nos héros étonnés s'approchent des chutes fameuses, et ils aperçoivent et ils admirent.

Ces rapides torrens dont la pente fougueuse
Rend de Niagara la chute merveilleuse.

Et le poète décrit longuement le spectacle:

Un gouffre haut, profond, de ses bouches béantes,
Gronde, écume et vomit, en ondes mugissantes,
Deux fleuves mutinés, deux immenses torrens;
Plus altier, plus fougueux que ces rochers ardens
Qui renferment la flamme, et lancent de leur gouffre
Les flots empoisonnés du bitume et du soufre,
Le premier des torrents, et le plus irrité,
Des rayons du soleil réfléchit la clarté.
Mille cercles d'émail qui s'agitent sans cesse
Glissent en tournoyant sur l'onde qui se presse.
Le torrent étincelle, et l'oeil tremblant, surpris,
Se fatigue d'y voir les cent couleurs d'Iris.
Le second sous les rocs, sous les cavernes sombres,
Roule sa masse d'eau dans le cahos des ombres.

. . . . .

Entre les deux torrents, une île suspendue
De l'abîme des eaux couronne l'étendue.
L'isle paraît mouvante, et ses bords escarpés
Par les flots en courroux sont sans cesse frappés.
Des chênes, des sapins sans écorce et sans cîme
Se penchent de vieillesse et tremblent sur l'abîme.
Les rocs rongés et creux, et les troncs inégaux
Aux timides Aiglons présentent des berceaux,
Tandis que l'Aigle fier des ailes qu'il déploie
Plane sur les torrents ou fond sur une proie.
La chute impétueuse entraîne dans son cours
La carcasse du pin, le cadavre de l'ours,

Que du lac Erié les vagues menaçantes
Enlèvent en grondant sur ses rives tremblantes,
Et qui parfois lancés hors des flots orageux,
Offrent à mes regards des fantômes hideux.

A ce premier tableau où il a voulu rendre le mouvement des eaux qui se divisent en deux fleuves, en deux torrents, enserrent une isle suspendue au-dessus de l'abîme, entraînent des débris de toute sorte, roulent avec fracas pendant que l'aigle tournoie et plane au dessus du gouffre, le poète oppose le spectacle tranquille, et pour cela grandiose encore et saisissant que l'on peut voir au pied de la cataracte. Ce spectacle contraste violemment avec le premier, car des paysages gracieux y encadrent des flots couverts d'écume qui s'apaisent déjà, glissent et s'endorment.

Je descends, je m'avance aux pieds de la cascade:
Le flot n'y poursuit plus la craintive Naïade.
L'onde des deux torrents semble s'y réunir,
Pour oublier sa chute et cesser de gémir.
C'est un tapis de mousse où la riche nature
Sur des flocons de neige étale sa parure.
L'écume en murmurant sur le flot épuré
S'étend, glisse et se perd dans le fleuve azuré;
Et sur les bords fleuris, l'onde toujours limpide
Offre un calme enchanteur près d'un torrent rapide.
C'est ainsi que j'ai vu, sous les pieds de l'Etna,
Les tapis émaillés des champs de Démona.

Or le poète a visité Niagara à l'heure où le soleil couchant répand sur les eaux la flamme rouge de sa pénétrante lumière; et voici donc comment, du pied de la chute où il observe, lui apparaît cette grande nappe d'eau qui se déroule et s'abîme:

La masse qui s'écroule offre de longs rideaux
Où l'émail pétillant promène ses tableaux:
J'y vois sur le saphir les perles les plus belles
Se suivre, tournoyer comme des étincelles.

1905
Roy

C'est le miroir ardent dont le cristal épais
De l'amant de Thétis refléchit les attraits.
Au-dessus de l'abîme on voit rougir l'écume;
L'esprit comme enchanté croit que l'isle s'allume;
Il croit que les sapins s'embrasent par degrés;
D'un horrible incendie il croit voir les effets.
C'est du couchant en feu la chaîne rayonnante
Dont tout l'éclat s'attache à la scène frappante,
Et ce tableau trompeur offre à mes yeux charmés
Au lieu des torrents d'eau des torrents enflammés.

Comme une touriste curieux et avisé, le poète *visite la chute*, et il raconte par le menu tous les accidents de cette nature tourmentée:

Entre deux vieux débris une glissante route
Guide mes pas errants sous une immense voûte.
Des flots et des rochers je vois l'horrible choc;
Je frémis avec l'eau, je tremble avec le roc.
Le cristal varié de la pierre et de l'onde
Illumine, enrichit cette grotte profonde.
La cascade bruyante en recourbant son eau,
Arrondit sur ma tête un liquide berceau;
Et les rocs élancés en forme de fantôme,
De ce temple mouvant environnent le dôme.

Mais voici la nuit; la cascade n'est plus qu'une masse sombre dont le roulement lugubre inspire la terreur. Le poète s'éloigne, emportant en son âme l'impression profonde qu'y laisse le spectacle des grandes œuvres de Dieu:

Je m'éloigne à regret de la scène sublime
Où la grandeur de Dieu se peint dans un abîme.
Dans cette solitude où tout paraît néant,
L'âme voit du Très-Haut le chef-d'oeuvre étonnant.
Cette voûte d'azur, ces nombreuses étoiles
Qui de la nuit jalouse ont traversé les voiles,

Ce calme que fatigue un murmure éternel, 1905
Ce colosse des eaux, phénomène immortel, Roy
De ces torrents fougueux l'orageuse surface,
Ce météore errant dans le céleste espace,
Ces antiques sapins, ces rochers sourcilleux,
Tout ici parle à l'âme et la met dans les Cieux.

Ainsi se termine en une méditation qui est une hymne et un élan vers Dieu l'une des meilleures poésies qu'ait inspirée, au commencement du siècle dernier, notre nature canadienne.

1906

WILKINSON, FLORENCE. Niagara. (Outl., Feb. 24, 1906. 82:432–433.) 1906 Wilkinson

THE WATER TALKED TO THE TURBINE
AT THE INTAKE'S COUCHANT KNEE:
Brother, thy mouth is darkness
Devouring me.

I rush at the whirl of thy bidding;
I pour and spend
Through the wheel-pit's nether tempest.
Brother, the end?
Before fierce days of tent and javelin,
Before the cloudy kings of Ur,
Before the Breath upon the waters,
My splendors were.

Red hurricanes of roving worlds,
Huge wallow of the uncharted Sea,
The formless births of fluid stars,
Remember me.
A glacial dawn, the smoke of rainbows,
The swiftness of the cañoned west,
The steadfast column of white volcanoes,
Leap from my breast.

1906
Wilkinson

But now, subterranean, mirthless,
I tug and strain,
Beating out a dance thou hast taught me
With penstock, cylinder, vane.
I am more delicate than moonlight,
Grave as the thunder's rocking brow;
I am genesis, revelation,
Yet less than thou.

By this I adjure thee, brother,
Beware to offend!
For the least, the dumbfounded, the conquered,
Shall judge in the end.

THE TURBINE TALKED TO THE MAN
AT THE SWITCHBOARD'S CRYPTIC KEY:
Brother, thy touch is whirlwind
Consuming me.

I revolve at the pulse of thy finger.
Millions of power I flash
For the muted and ceaseless cables
And the engine's crash.
Like Samson, fettered, blindfolded,
I sweat at my craft;
But I build a temple I know not,
Driver and ring and shaft.

Wheat-field and tunnel and furnace,
They tremble and are aware,
But beyond thou compellest me, brother,
Beyond these, where?
Singing like sunrise on battle,
I travail as hills that bow;
I am wind and fire of prophecy,
Yet less than thou.

By this I adjure thee, brother,
Be slow to offend!
For the least, the blindfolded, the conquered
Shall judge in the end.

THE MAN STROVE WITH HIS MAKER
AT THE CLANG OF THE POWER-HOUSE DOOR:
Lord, Lord, Thou art unsearchable,
Troubling me sore.

I have thrust my spade to the caverns;
I have yoked the cataract;
I have counted the steps of the planets.
What thing have I lacked?
I am come to a goodly country,
Where, putting my hand to the plow,
I have not considered the lilies.
Am I less than Thou?

THE MAKER SPAKE WITH THE MAN
AT THE TERMINAL-HOUSE OF THE LINE:
For delight wouldst thou have desolation
O brother mine,
And flaunt on the highway of nations
A byword and sign?

Have I fashioned thee then in my image
And quickened thy spirit of old,
If thou spoil my garments of wonder
For a handful of gold?
I wrought for thy glittering possession
The waterfall's glorious lust;
It is genesis, revelation,—
Wilt thou grind it to dust?

1906
Wilkinson

Niagara, the genius of freedom,
A creature for base command!
Thy soul is the pottage thou sellest;
Withhold thy hand.
Or take him and bind him and make him
A magnificent slave if thou must —
But remember that beauty is treasure
And gold is dust.

Yea, thou, returnèd to the fertile ground
In the humble days to be,
Shalt learn that he who slays a splendor
Has murdered Me.
By this I adjure thee, brother,
Beware to offend!
For the least, the extinguished, the conquered,
Shall judge in the end.

WILKINSON, FLORENCE. Niagara. (Cur. lit., May, 1906. 40:559–560.)

WILKINSON, FLORENCE. Niagara. (Wld's work, May, 1906. 12:7479.)

1907

1907
Blake

BLAKE, HENRY T. Ode to Niagara Falls. (Jour. Am. hist., Jan., 1907. 1:141–142.)

1907
Logan

LOGAN, JOHN D. Over-song of Niagara. (Can. mag., Sept., 1907. 29:440.)

Why stand ye, nurslings of Earth, before my gates,
Mouthing aloud my glory and my thrall?
Are ye alone the playthings of the fates,
And only ye o'ershadowed with a pall?
Turn from this spectacle of strength unbound —
This fearful force that spends itself in folly!
Turn ye and hark above the organ sound
My Over-song of Melancholy!

1907
Logan

" I rush and roar
Along my shore,—
I go sweeping, thundering on;
Yet my days, O Man,
Are but as a span,
And soon shall my strength be gone.
My times are measured
In whose hand I am treasured,
(Think not of thy little day!)
Though I rush and roar
Along my shore,
I am passing away —
Passing away!"

. . . . .

Then stand not, nurslings of Earth, before my gates,
Mouthing aloud my glory and my thrall:
Not ye alone are playthings of the fates,
Nor only ye o'ershadowed with a pall!

But hark to my song
As I sweep along,
Thundering my organ-tone —
" O vain is all Life
O vain is all Strife,
And fruitless the years that have flown!
As the Worst; so the Best —
All haste to their rest
In the void of the primal Unknown."

1908

1908
Barlow

Barlow, John Richard. The maiden of the mist; an Indian legend of Niagara: (origin of the great paintings the Red man's fact and the White man's fancy.) Niagara Falls, N. Y.: Niagara Courier Press. 1908.

A story in verse of Indian punishment and love. An indian maiden follows over the Falls her lover, who has been condemned to death by being lashed in a canoe and sent over the Falls. Her form may still be seen in the mist at the foot of the Falls.

1908 Young

YOUNG, *Rev.* W. MONTGOMERY. Rushing waters and deep sea pearls. 2d ed. Buffalo. Ulbrich. 1908.

Two poems in reminiscent mood and rather halting meter.

1909

1909 Deuther

DEUTHER, CHARLES GEORGE. Canticles of Niagara, and other poems. (Buffalo, 1909.)

Attempts at descriptions of the Canadian seasons in 1600 and of the river and Falls.

1909 Ward

WARD, *Mrs.* HUMPHREY. Marriage à la mode. N. Y.: Doubleday, Page and Co. 1909. Pp. 247–291.

A story of marital infelicity and the laxness of American divorce laws which brings a group of its characters to Niagara, and keeps them there for two chapters. Interspersed through these two chapters are bits of description of the sound of the Falls at night through a heavy fog, as well as some more cheerful descriptions of their appearance on bright summer days. This story appeared in England under the title of *Daphne*.

Only a few yards from her the vast sheet of water descended. She could see nothing of it, but the wind of its mighty plunge blew back her hair, and her mackintosh cloak was soon dripping with the spray. Once, far away, above the Falls, she seemed to perceive a few dim lights along the bend of the river; perhaps from one of the great power-houses that tame to man's service the spirits of the water. Otherwise — nothing! She was alone with the perpetual challenge and fascination of the Falls.

. . . . .

. . . A light wind had risen and the fog was now breaking rapidly. As it gave way, the moonlight poured into the breaches that the wind made; the vast black-and-silver spectacle, the Falls, the gorge, the town opposite, the bridge, the clouds, began to appear in fragments, grandiose and fantastical. . . .

The first days of June broke radiantly over the great gorge and the woods which surround it. . . .

The invalid had just asked that her couch might be drawn as near to the window as possible, and she lay looking towards the

dawn, which rose in fresh and windless beauty over the town opposite and the white splendour of the Falls. The American Fall was still largely in shadow; but the light struck on the fresh green of Goat Island and leaped in tongues of fire along the edge of the Horseshoe, turning the rapids above it to flame and sending shafts into the vast tower of spray that holds the centre of the curve. Nature was all youth, glitter and delight; summer was rushing on the gorge; the mingling of wood and water was at its richest and noblest. 1909 Ward

1910

BATES, KATHARINE LEE. The song of Niagara. (Can. mag., May, 1910. 35:58.) 1910 Bates

An alien song. Though day by day I listen,
No syllable of that majestic chant
May my adoring passion comprehend.
With many a lucent evanescent hue
The plunging torrents glisten.
Far-seen, colossal plumes of spray ascend,
Their dazzling white shot through and through
With quivering rainbows, until every plant,
Each hoar, blue-berried cedar loved of bird,
Each fine fern tracery, the cold mists christen
To spirit grace. The frosted branches bend
With sparkle of such jewels as transcend
All fantasy of elfin-craft. Yet who
Interpreteth the great enchantment's word?

Ye primal Sibyls, if eyes hardly bear
The glory of your opalescent robes,
Your diamond aureoles and veils impearled,
May the stunned ear divine
Your awful oracle? August, yet wild,
Do your tremendous paeans still prolong
Creation's old, unhumanised delight,
The laughter of the Titans? Were ye there

1910
Bates

With your deep diapason answering
The Archangelic, chanting, golden globes,
What time they chorused forth their crystalline,
Exultant welcome to the stranger world?
Or is it, tolling cataracts, the doom,
The unrevealable, forbidden thing,
Your antiphonic, solemn voices boom?
Or peradventure do your peals proclaim
Some all-triumphal Name
That could it once be won
By mortal ear
Would ecstasy the griefs we suffer here
And charter love to wing
Her radiant flight beyond oblivion?
Dread Sisters, ye who smite
The senses with intolerable roar,
Is there no meaning in your ceaseless song,
No word of God in all your mighty throng
Of multitudinous thunders evermore?

1910
Guthrie

GUTHRIE, WILLIAM NORMAN. Niagara twice seen, and other verse. (Sewanee, Tenn.); Univ. Press; Cincinnati: Clarke. (c. 1910.) Pp. 1–32.

Begins with a prelude and after dealing with the Falls from all points — the gorge, the whirlpool, the upper rapids, etc.— and under all aspects of mist, sun and storm, closes with a view of the Falls from afar and a farewell.

1910
Humphrey

HUMPHREY, LUCY H. *comp.* The poetic new-world. N. Y.: Henry Holt and Co., 1910. Pp. 334–342.

Contains Hawthorne's appreciation of Niagara, and three poems, The Cataract Isle, by C. P. Cranch; Niagara, by Florence Wilkinson; and At Niagara, by R. W. Gilder.

1911

1911
Popham

POPHAM, WILLIAM LEE. Niagara Falls romance. Louisville, Ky.: The World Supply Co. (c. 1911.)

An involved love story, in which all the characters finally marry their real loves.

WYATT, EDITH. Niagara. (Lit. dig., Sept. 27, 1913. 47:544.) **1913 Wyatt**

A nature poem.

Cool the crystal mist is falling where my song is calling, calling
Over highland, over lowland, fog-blown bluff and bouldered shore:
Proud my snow-rapt currents leaping from Superior's green keeping.
Down from Michigan's gray sweeping toward the Rapid's eddied floor.

Rain, hail, dew and storm-cloud swing me; from the heights the hollows wring me;
Filtered clay and field silt bring me silent through the dark-breathed loam,
Down the thousand-terraced highlands till the skyland lake-beds wing me —
Flying down and down in beauty through the chasm's flocking foam.

Down from Huron, down from Erie, tho the wild duck's wing grow weary,
Tribe and nation part and vanish like the spin-drift haze of morn,
Fresh my full-fold song is falling and my voice is calling, calling
Down from far-poured lake and highland as I sang when I was born.

South, North, East and West untiring speak my brother seas in splendor,
Tell their dominant desiring, claimant over coast and main,
Mine the choiring of a woman's chord immortal, of surrender —
Of the splendor of desiring, deep to give and give again.

1913
Wyatt

Chord of star-fused loam and silver-surgent lake cloud's generation,
Here I sing the earth's still dreaming down my green-poured currents' length,
Voice of river-rocking valleys, rich heart plains and heights' creation,
Clear-veiled chord that locked in you your mother's life, your father's strength.

Cool the fog-flocked mists are swinging. Soar my dream; and silver winging,
Call my air-hung music ringing, toward the crystal-buoyed morn —
Full-fold music from the highlands, where my splendor's voice is singing,
Fresh from flooded shores and skylands as I sang when I was born.

1913
Zaremba

ZAREMBA, EDWARD. Niagara captive; a poem. (Metal. and chem. eng., March, 1913. 11:120.)

Niagara captive! And by ribbons led!
His mighty force with that of toiling head
And hand to join. So changed since ancient days
When red men chanted hymns of praise;
In flower-laden white canoe
Each spring their fairest maiden sent into
The Thunder of the Waters.

Niagara an adult and to Effort bred —
No more to play the livelong day,
But proudly share the sweat and grime
Of stalwart manhood's laboring prime.
The evergrowing purpose runs; —
Earth's wealth is measured, not the sun's;
The stewards of great treasure may
Not waste Tomorrow's dire need
For Pleasure's or for Profit's greed.

VIEWS OF NIAGARA

Showing the commercial buildings as they existed in the eighties before the State took it over as a reservation

Oh, Hercules, still at thy labors keep! 1913
Canst take the raging current from the flood Zaremba
And swiftly, silent 'round a cable sweep?
Ye Seven Wonders of the ancient world,
Long since into oblivion hurled,
Your kings and gods born to commemorate —
'Tis to the people do we dedicate
The Wonders of Today.

1915

CRUIKSHANK, JULIA. Whirlpool heights: the dream-house on the Niagara river. Lond.: George Allen & Unwin Ltd. 1915. 1915 Cruikshank

A story of the making of a home on land overlooking the whirlpool on the Canadian side of the Niagara river. It is written in the form of a diary, interspersed with many charming bits of description, sometimes of the Falls, sometimes of the river, and again of the rapids or the whirlpool.

1893

BICKFORD, E. L. T. HARRIS. The Falls of Niagara. (*In his* Gold — the god and other poems. Camborne: author. n. d. Pp. 113–117.) 1893 Bickford

THE FALLS OF NIAGARA.

Imagination ever kind,
Nursling of the poets' mind,
Imps her wings, and soars afar
To where Niagara's waters are,
And there, whilst throned on towering steep
Beholds its rumbling torrent sweep!

Tremendous, stupendous, romantic, gigantic,
Gymnastic, fantastic, elastic, and plastic,
It splashes, and crashes, and lashing down-dashes,
It rumbles and roars, and plunging it pours,
It rolls and uprises, it swells and surprises,

1893
Bickford

It hissingly seethes, and it writhingly wreathes
A watery chaplet of feathery foam,
It flutters, it sputters, it cleaves and it weaves
A mystical mantle as on it doth roam;
Ay, onward for ever, and silent-voiced never,
But headlong it rushes, it gurgles, it gushes,
Through years and thro' ages it riots and rages,
'Tis as old as the sun, yet its race is not run,
It shimmers, it glimmers,
It baffles all swimmers,
It quivers, it shivers, the grandest of rivers,
Like ship-bearing oceans majestical motions,
'Tis ever resounding,
Rebounding,
Confounding,
'Tis ever astounding
The senses of man!
It ever up-leapeth
O'er-heapeth
On-keepeth,
And swelling o'er-sweepeth
The rocks sparry span!
Vibrating, gyrating, elating nor 'bating,
It rideth, collideth, and slideth, and glideth,
And hurleth and whirleth, and purleth, and curleth,
And waileth, and traileth, then raileth, and quaileth,
It frowneth,
It drowneth,
It boundeth,
It soundeth,
Till tree, crag and rock
Re-echo the shock,
Till valley and hill
Give answering shrill,

O'er-powering, o'ertowering, spray-showering and scouring 1893 Bickford
It trips, and it slips, and it grips, and it rips,
It muffles, and shuffles, and ruffles, and scuffles,
Portrays, and delays, and dismays whilst it sways,
And spangles, and tangles, and angles, and wrangles,
It beats, and it cheats, and it fleets, and retreats,
and so forth.

1886

WARD, JAMES WARNER. To Niagara. (*In* Niagara river and Falls. Buffalo: Thos. F. Fryer. 1886. Plate CIII. *Also in* The poets and poetry of Buffalo, ed. by Ina Russelle Warren. Buffalo: Charles W. Moulton. N. D. P. 24.) 1886 Ward

Rapt and amazed, midst scenes of rarest loveliness,
Stand I alone, entranced, in awe and ecstasy
Gazing in silence o'er the cliffs precipitous,
Whence, with united front, thy waters ponderous
Tranquilly take their giant leap, Niagara!

Forward declining, wreathed in conscious majesty,
Shimmering spray and jewelled drop, tossed back from thee,
Wave pressed to wave in serried ranks, as, steadily,
Man against man, sweeps on a line of infantry,—
Into the vertex rolls thy flood intrepidly.

In the fierce rapids, many a sharp rock, secretly,
Under thy foaming current lay in wait for thee,
Gashing and tearing thy rent bosom wantonly;
Loveliest of Rivers, sad and dire similitude,
So in life's breakers strives man's heart with destiny.

Tossed in the raging stream by waves impetuous,—
Glamor of hope and youthful dreams deserting it,—
So have we seen,— ah River wild and beautiful,
Art thou not here of " fortune's buffets " typical? —
Under life's chaos sinks heart-broke humanity.

1886
Ward

Hither and thither whirled in eddies infinite,
Leaping in lambent jets and cascades showery,
Over the sunk rocks pourest thou unceasingly,—
So in life's drift and swirl man writhes defiantly,
Only in wreck, at last, to end, disastrously.

Cometh a change to Life and River, presently;
Out of its perils Life emerges, jubilant,
E'en as thy waters seek in calm serenity,
Under this arched and rainbow broidered canopy,
Torrent immortal, rest an instant in thine agony.

Haste is there none, but eagerness and promptitude;
Frivolous things are cast aside disdainfully;
Nothing the brink can pass but heaven-lit purity;
As on thy emerald crown, we see, Niagara,
Naught but the gem-like gleams from the blue sky over thee,

Out of the far off past emerging regally,
Stately in step, thy grandest one now daring thee,—
Architect fine and subtle, never loitering,
Minute by minute, frost and whirlwind aiding thee,
Toilest thou deftly, thine own highway channelling.

Onward proud River! — many a voiceless century
Into the shadow past had vanished recordless,
Did not the lines and chinks of thy shrewd chiselling,
Scarring the polished tablets of thy cenotaph,
Tell us the mystic story of thy genesis.

Summary

Poetry

This chapter under the heading of Music-Poetry-Fiction, will reveal the absence of any Niagara verse from the pens of the most of the great poets. Goldsmith and Thomas Moore are two exceptions to this rule. Yet strangely enough many of the great singers have written exalted and poetic prose descriptions of the cataract.

The first Niagara verse of which we have any record appeared in the dedicatory sonnet of Champlain's " Des Sauvages," 1604, and the amount has steadily increased until the present day, probably the most prolific period being in the first half of the nineteenth century. Naturally American poets predominate in the list, but the greatest of our Americans are conspicuous by their absence. Mrs. Sigourney is probably the best known of the American verse-writers, but the poems of several obscure American poets are much more pleasing to modern critical taste. As might be expected there are several collections of Niagara poetry, the best of these being contained in Longfellow's *Poems of Places*, where under the Niagara heading may be found the choicest of this verse.

Music

The sound of Niagara has been such a fruitful subject of discussion that it is surprising that more musical literature on the subject does not exist. The Niagara composition of Ole Bull provoked some writing on the subject, but very little of it was in the form of permanent literature. In 1881 Eugene Thayer investigated the music and tone of the Falls and the articles which he wrote on this subject, together with the varying opinions called forth by these articles, comprise the only other literature on the subject which research has revealed. However, many of the writers of general descriptions have recorded their observations and views concerning the sound and music of the Falls.

Fiction

It was the fashion with a type of fiction writers about the time of the War of 1812 and an even earlier period to use the region of Niagara as a background for their stories. These, with the Indian myths and legends, and the adventurous travels which belong rather to the realm of romance than fact, comprise the greater part of the early fiction connected with Niagara. In later years the region appears but seldom in fiction but modern

romance has given us two of the finest pieces of prose in Niagara literature. One is contained in Howells' "Their Wedding Journey," and the other in Charles Dudley Warner's "Their Pilgrimage." Both of these American novelists use the Falls as a background for the weaving of a portion of their stories, and the descriptions of the Falls under various aspects are sympathetic and satisfying.

Chapter IX

CHAPTER IX

MAPS AND PICTURES

1632

CHAMPLAIN, SAMUEL DE. Champlain map, 1632. (*In* Oeuvres de Champlain publiées sons le patronage de L'Université Laval par L'Abbé C.–H. Laverdière. 2d ed. Quebec: 1870. Vol. II. Opp. p. 1385.) 1632 Champlain

Wavy lines are marked, 90″. Page 1390 says of 90″ — "Sault d'eau au bout due sault Sainct Louis fort hault, ou pluisieurs sortes de poissons descendens s'estourdissent." The map is accompanied by "Table pour cognoistre les lieux remarquables en ceste carte." "This is the first map of Niagara, and a very clear and marked outline of the river is given."

Carte de la nouvelle France, augmentée depuis la derniére seruant a la navigation faicte en son vray Meridien par le S'r de Champlain, Capitaine pour le Roy en la Marine, le quel depuis, l'an 1603, jusques en l'année 1629; a descouvert plusiers costes terres; lacs rivieres et Nations de sannoges por cy diuant incognues comme il se voit en ses relations qui'l a faict. Imprimer en 1632. (*In* O'Callaghan, E. B., Documentary history of the state of New York. Albany: 1849. Vol. III. Frontispiece p. 13.) 1632

"Very high waterfall at the head of Sault (Lake) St. Louis; descending which various sorts of fishes become dizzy." [Niagara.]

1656

SANSON, N——. Le Canada, ou Nouvelle France. . . . Par N. Sanson d'Abbeville Geographe ordinaire du Roy. A Paris: Chez Pierre Mariette Rue S. Jacque a l'Esperance. Avecq Privilege du Roy, pour vignt ans. 1656. 1656 Sanson

"Ongiara Sault" indicated by a break.

1656 Sanson

Sanson's map of Canada. (Ann. archaeological rep't, 1897–1898, being part of appendix to the report of the minister of education, Ontario. Toronto: 1898. Pp. 47–49.)

Sanson's map, 1656, was the first to show Ongiara Sault. Another map of about a hundred years later shows " Jagara, car. place."

1657

1657 Sanson

SANSON, N——. Canada of Niew Vrankryk. Getroken mit verscheide Fransche, Engelsche en Hollandische Beschryvingen enz. Door N. Sanson de Abbeville. [1657.] 8x12.

SANSON, N——. Le Canada, ou Nouvelle France. . . . Tirée de diverses Relations de François, Anglois, Hollandais. . . . Par N. Sanson d'Abbeville. 8½x12. (*In his* L'Amérique en plusieurs cartes. Paris: L'autheur. 1657. No. 2.)

" Ongiara Sault."

1664

1664 Creuxius

CREUXIUS, FRANISCUS. (S. J.) New France in 1660. (Reduced facsimile *from his* " Historia Canadenses." Paris: 1664.)

" Ongiara catarractes " indicated.

CREUXIUS, FRANCISCUS. New France in 1660. (Reduced facsimile *from his* Historia Canadenses, Paris.) (*In* Thwaites, R. G., Jesuit relations. Cleveland: 1900. Vol. 46. Frontispiece.)

Marks " Ongiara catarractes " between Lakes Erie and Ontario. The proportions are poor.

1669

1669 Sanson

SANSON, N——, and G——. Amérique Septentrionale. Par N. Sanson. Reveuë et changée en plusieurs endroits suivant les mémoires les plus récents. Par G. Sanson. 15½x22. A Paris. Chez Pierre Mariette. 1669.

No name but break indicates the Falls.

1671

1671 Meursium

MEURSIUM, JACOBUM. Novissima et accuratissima totius Americae descriptio per Jacobum Meursium. 17x20. (*In* Montanus, Arnoldus, De nieuwe en onbekende wereldt. Amsterdam: J. Meurs. 1671. Frontispiece.)

1674

JOLIET, LOUIS. Nouvelle découverte de plusieurs nations dans la Nouvelle France en l'année 1673 et 1674. Gaston Morel lith. (Reduction facsimile.) Imp. E. Cagniard à Rouen. 16x21½. (*In* Mag. of Am. hist. Ed. by John Austin Stevens. N. Y.: A. S. Barnes. 1882. 9:273.) 1674 Joliet

"Sault" indicated. The map is from the same source as the one published in the "Jesuit relations" in 1900, noted below.

JOLIET, LOUIS. Nouvelle découverte des plusieurs nations dans la Nouvelle France, en l'année 1673 et 1674. 21x15¾. (*In* Thwaites, R. G., Jesuit relations. Cleveland: Burrows Bros. 1900. Vol. 59. P. 86.)

"Reproduced in facsimile from *Revue de Geographie*, for February, 1880." . . . "Sault" indicated. The map is the same as the one published in the Magazine of American History for 1882, volume 9, page 273.

PORTER, PETER AUGUSTUS. How lake commerce began; La Salle's visits to the Niagara. Niagara Falls, N. Y.: n. d. P. 11. 1674 Porter

The La Salle map in this volume is founded on the map of 1674.

1682?

Carte pour suivre la relation des voyages de cavalier de La Salle, 1669–1682. 7x6½. (*In* Société de géographie. Bulletin. 6 serie. Paris: 1880. Vol. 20. At end.) 1682?

Shows the "River Niagara" but not the Falls.

1684

FRANQUELIN, JEAN BAPTISTE LOUIS. Carte de la Louisiane ou des voyages du sr. de la Salle & des pays qu'il a découverts depuis la Nouvelle France jusqu'au golfe Mexique, les années 1679, 80, 81, & 82. 20½x16. Paris: 1684. (*In* Thwaites, R. C. *ed.*, Jesuit relations. Cleveland: Burrows Bros. 1900. Vol. 63. Opp. title page.) 1684 Franquelin

A reduced facsimile copy of this map of Franquelin's (made in Paris for Francis Parkman) is in the Library of Harvard University. The original, formerly in the Archives de la Marine, Paris, has been lost. "Saut de Niagara" is indicated halfway between Lac Frontenac and Lake Erie. The map is good. Franquelin was hydrographer to Louis XIV.

1687?

1687?
Homanno

HOMANNO, J. B. Complissimae Regionis Mississippi; Seu Provincae Ludovicianae à R. P. Ludivico Hennepin Francise Miss. in Amerique Septentrionale Anno 1687, detectae nunc Gallorum Coloniis et Actionum Negotiis toto Orbe celeberrimae. Nova Tabula edita á Jo. Bapt. Homanno S. C. M. Geographo Norimbergae. Cim Privilegis Sac. Cas. Mig.

A break shows the "Saut de Niagara de 500 pieds," and there is a view inset of the "Catarrhacta ad Niagara."

1688

1688
Franquelin

FRANQUELIN, JEAN BAPTISTE LOUIS. Map of 1688 of North America. (*In* Marshall, Orasmus H., Historical writings. Albany: Munsell & Sons. 1887. P. 93.

"This map indicating Niagara 'saut' was 'drawn in 1688 by order of the Governor and Intendent of New France, from sixteen years observations of the authors.' It is five feet long and three feet wide. Lakes Ontario and Erie, with the adjacent country, are for that early day remarkably well delineated. The Niagara river and falls are distinctly represented with a portage road around the latter, on the American side. A facsimile of that portion of the map which embraces the Niagara river reproduced from a careful tracing over the original, is given on the following page." (93.)

1688
Coronelli

CORONELLI, [M. V.] Partie occidentale du Canada ou de la Nouvelle France ou sont les nations des Ilinois, de Tracy, les Iroquois, et plusieurs autres peuples; avec la Louisiane nouvellement découverte. . . . Dressée sur les Memoires les plus Nouveux Par le P. Coronelli Cosmographe de la Ser'me Republique de Venise. Corrigée et augmentée Par le S'r. Tillemon; et Dediée a Monsieur l'Abbé Baudrand. A Paris. Chez J. B. Nolin sur le Quay de l'Horloge de Palais Vers le Pont Neuf a l'Enseigne de la Place des Victoires. Avec Privilege du Roy. 1688.

"Saut de Niagara de 100 tois en perpindiculaires."

1689

1689
Coronelli

CORONELLI, [M. V.] l'Amérique Septentrionale, ou la Partie Septentrionale des Indes occidentales. Dressée sur les Nouveaux Corrigée et augmentée Par le Sr. Tillemon; et Dediée a son Excellence Monseigneur Pierre Venier, ambassadeur ordinaire de la Serenissime Republique de

Venise, pres di sa Majesté tres Christienne Louis le Grand. Par le P. Coronelli, Cosmographe de la Ser'me Republique de Venise. A Paris: Chez J. B. Nolin sur le Quay de l'Horloge des palais, Vers le Pont Neuf, a l'Enseigne de la Place des Victoires. Avec Privilege du Roy. 1689. **1689 Coronelli**

A break shows the "Saut Niagara."

CORONELLI, [M. V]. Partie orientale du Canada ou de la Nouvelle France ou sont les Provinces, ou Pays de Saguenay, Canada, Acadie. . . . Les Peuples, ou Nations des Etechemins, Iroquois, Attiquomeches. . . . avec la Nouvelle Angleterre, La Nouvelle Ecosse, la Nouvelle Yorck, et la Virginie, les Isles de Terre Neuve, de Cap Breton. . . . Dressé sur les Memoires le plus Nouveaux par le P. Coronelli cosmographe de la Serenis'me Republique de Venise. Corigée et augmentée par le S. Tillemon et Dediee a Monsieur l'Abbe Baudrand par son tres humble Serviteur J. B. Nolin. A Paris. Chez J. B. Nolin. 1689.

A break indicates the " Saut Niagara."

1691–1693

ANZI, CONTE AURELIO DELGI. Nuova Francia e Luigiana. 8¾ x 11½. [*In* Zani, Valerio, Il genio vagante. Biblioteca curiosa di cento a più relazioni di viaggi [etc.] raccolta dal signor conte Aurelio delgi Anzi, (pseud.) Parma per I. & F. M. Rosati, 1691–1693. Pt. 2. bet. pp. 422–423.) **1691–93 Anzi**

" Il gran salto di Niagara"

1692

ROUILLARD, I——. Carte généralle de la Nouvelle France où est compris la Louisiane, Gaspésie et le Nouveau Mexique avec les mémoires les plus nouveau 1692. I. Rouillard delineavit. L. Boudan sculp. 13 x 19. (*In* Le Celarcq, Christian, First establishment of the faith in New France. N. Y.: 1881. Vol. Ii. P. 8.) **1692 Rouillard**

Note.— " Some copies of the map are said to bear the date 1692. The last figure has something of the appearance of a 2, but seems to be really 1, and has probably been read differently." The "Sault de Niagara " is indicated.

1695

CORONELLI, [M. V.]. La Louisiana, parte settrionalle scoperta sotto la prottettione de Luigi XIV. Re di Francia. . . . Dal. Coronelli. (Atlante Veneto. Venice: 1695. 1:28.) **1695 Coronelli**

Indicates " Saut di Niagara."

1696

1696
Allard

ALLARD, CAREL. Recentissima novi orbis, sive Americae Septentrionalis et Meridionalis tabula. (*In his* Atlas minor. . . . Amstelodami. Ex officina Caroli Allard. [1696]. No. 138.)

"Saut de Niagara."

1697–187–

1697–187–

Grosvenor Library, Buffalo, N. Y. Views of Niagara Falls, taken from various sources. 1697–187–.

These views are mounted on twenty-six large mats and annotated in chronological order. Each view is cited separately in this chapter, in its chronological order, reference in each case being made to the Grosvenor Library and the number of the mat on which the view may be found.

1697

1697
Hennepin

HENNEPIN, LOUIS. Carte d'une tres grand pais nouvellement découvert dans l'Amerique Septentrionale entre le Nouveau Mexique et la Mer Glaciale. 14½x17. (*In his* Nouveau voyage. À Utrecht. 1697.)

"Saut de Niagara de 100 Toises."

HENNEPIN, LOUIS. Carte d'un tres grand pays entre le Nouveau Mexique et la Mer Glaciale. 16½x20. (*In his* Nouveau voyage. À Utrecht. 1697.)

"Saut de Niagara."

HENNEPIN, LOUIS. Chute d'eau de Niagara. 5x6½. (*In his* Nouvelle découverte d'un très grand pays situé dans l'Amérique. Utrecht. G. Broedelet. 1697. P. 44.)

This first picture of Niagara Falls set the type which was followed by engravers and artists for upwards of one hundred fifty years. It is so drawn that there appears to be a third fall, and Goat Island shows as a pile of rock. The island and shores are covered with unnatural fir trees, and in the foreground are Indians pointing out the wonders of the Falls to Europeans who appear overcome with astonishment and wonder at the stupendous grandeur of the Falls. This picture does not appear in the Paris edition of 1683, but persisted with variations through several generations as the European idea of the Falls.

(HENNEPIN, LOUIS.) A fac-simile view of Niagara Falls. (Grosvenor Library, Buffalo, N. Y. Views of Niagara Falls. 1697–187–. Mat 1.) **1697** Hennepin

HENNEPIN, LOUIS. Hennepin and variations. (Hennepin, First picture of Niagara Falls. Utrecht, 1697.)

Black and white prints all founded on Hennepin's first picture of the Falls, published at Utrecht in 1697. The second one with the third fall on the American side, is entitled "Wasserfall von Niagara," and the third published in London by Thomas Kelley, 17 Paternoster Row, "Waterfall of Niagara."

1698

HENNEPIN, LOUIS. A map of a new world between New Mexico and the frozen sea newly discovered by Father Louis Hennepin. . . . (*In his* A new discovery of a country greater than Europe; situated in America, betwixt New Mexico and the frozen sea. Lond.: Bentley, Tonson, Bonwick, Goodwin & Manship. 1698.) **1698** Hennepin

The frontispiece 10½x17 shows the "Great Falls of Niagara." A view faces page 28.

HENNEPIN, LOUIS. Carte d'une nouveau monde entre le nouveau Mexique et la Mer Glaciale. 11x18. (*In his* Nouveau voyage. A Utrecht. 1698.)

"Le grand Sault de Niagara."

1700

(The) Falls of Niagara. (Grosvenor Library, Buffalo, N. Y. Views of Niagara Falls. 1697–187–. Mat 1.) **1700**

This gives a front view of the Canadian Fall and part of the American. Goat Island and Luna Island are shown as straight rocky cliffs, with three small islands between Goat Island and the American shore. Both shores are wooded and some plum trees are evident on the islands. Some small figures can be seen on the Canadian side below.

LE CLERC, SEBASTIAN. Chute de la Rivière de Niagara. Elie énléve dans un Char du Feu. Engraved about 1700. **1700** Le Clerc

This print is a copy of a very rare plate, bearing the double legend given in the title. The Falls are fully as high and straight as shown in the Hennepin picture, which was probably printed a few years earlier. Elijah is shown in a chariot of fire with a pair of prancing steeds above the cataract. The combination of natural and spiritual wonder is unusual.

1700 Le Clerc — LE CLERC, SEBASTIAN. (Elie énléve dans un Char de Feu.) Grosvenor Library, Buffalo, N. Y. Views of Niagara Falls. 1697–187–. Mat 1.)

1700 Dember — DEMBER, GEORGE. Map of Niagara river or the straights between the Lakes Erie and Ontario, by Geo. Dember, 60th Reg'mt. (*In* O'Callaghan, E. B., The documentary history of the state of New York. Albany: 1849. Vol. II. P. 458.)

"Latitude from Mr. Elliott. . . . Falls 43° 4′ 25″. Height 150 feet." . . .

1700 Luken — LUKEN, CASPAR. Niagara. (1697.)

A copy of this quaint old engraving may be seen in the New York Public Library. It is dated 1697, but that is probably an error, as it is a copy of the Hennepin view, which was not published until 1697.

1702

1702 Campanius Holm — CAMPANIUS HOLM, THOMAS. (View of the Falls of Niagara.) T. Ch. (sc.) 5¼ x 5¾. (*In his* Kort beskrifning om provincien Nya Severige uti America, som nu forjden af the Engelske kallas Pennsylvania. Stockholm: S. Wankyfs. 1702. Opp. P. 4.)

A Hennepin view with the left-hand figures and the trees omitted. Opposite page 52 is a map "Virginiae N. Angliae, N. Hollandiae nec no Novae Sueciae Delineatio." "Sault de Niagara" indicated by a break in the river.

1702 — The cataract of Niagara. (1702.) (Print.)

"Some make this waterfall to be half a League while others reckon it no more than a hundred Fathom."

"A view of ye Industry of ye Beavers of Canada in making Dams to stop ye Course of a Rivulet, in order to form a great Lake, about which they build their Habitations. To effect this: they fell large Trees with their Teeth, in such manner as to make them come cross ye Rivulet, to lay ye foundation of ye Dam; they make Mortar, work up and finish ye whole with great order and wonderful Dexterity."

"The Beavers have two Doors to their Lodges, one to the Water and the other to the Land side, according to French accounts."

FER, N——DE. Le Canada, ou Nouvelle France, la Floride, la Virginie, Pensilvanie, Caroline, Nouvelle Angleterre et Nouvelle Yorck, l'Isle de Terre Neuve, la Louisiane et le Cours de la Rivière de Misisipi. Par N. de Fer. Geographe de Monseig. le Dauphin. A Paris: Chez l'auteur. . . . 1702. 1702 Fer

" Sault d'une demie Lieue."

1703

DE L'ISLE, GUILLAUME. Carte de la Louisiane et au cours du Mississippi dressée sur un grand nombre de Memoires entr' autres sur ceux de M'r le Maire. Par Guillaume Del'Isle de l'Academie R'le de Sciences. (*In his* Atlas nouveau. Amstedam: N. d. Chez Jean Covens et Corneille Mortier. No. 98.) 1703 De l'Isle

" Saut de Niagara de 600 pieds de haut."

DE L'ISLE, GUILLAUME. Carte de la Louisiane et du cours du Mississippi. (Grosvenor Library, Buffalo, N. Y.: Maps, historical and miscellaneous. No. 80.)

DE L'ISLE, GUILLAUME. Carte du Canada ou de la Nouvelle France et des découvertes qui y ont été faites. À Paris: 1703. (Maps of Am. Vol. I. No. 10.)

" Niagara le Saut."

DE L'ISLE, GUILLAUME. Carte du Canada ou de la Nouvelle France et des Decouveries qui q ont ete faites dressée sur plusieurs Observations et sur un grand nombre de Relations imprimées ou manuscrites. Par Guillaume De l'Isle de l'Academie Royale des Sciences et Premier Geographe du Roy. A Paris: 1703.

" Niagara le Saut " too near Ontario.

DE L'ISLE, GUILLAUME. Carte du Mexique et de la Floride, des terres Angloises et des isles Antilles, du course et des environs de la rivière de Mississipi. Dressé sur un grand nombre de mémoires, principalmt. sur ceux de mr d'Iberville et Le Seur. Par Guillaume De l'Isle. Geographe de l'Academie Royale des Sciences. À Paris: Chez l'Auteur. 1703.

A break indicates the " Saut de Niagara."

DE L'ISLE, GUILLAUME. Carte du Mexique et de la Floride, des terres Angloises et des isles Antilles, au course et des environs de la

1703
De l'Isle

rivière de Mississipi. Paris: Chez l'auteur. 1703. (Maps of Am. Vol. I. No. 8.)

"Saut de Niagara."

De l'Isle, Guillaume. Nouvelle Carte particulière de l'Amerique, ou sont exactment marquées une partie de la Baye d'hudson, le pays des Kilistinons, la Source de la grande rivière de Mississippi, le pays des Illinois. . . . (*In his* Atlas nouveau. Amsterdam: N. d. Chez Jean Covens et Corneille Mortier. No. 92.)

Shows the "Fall of Niagara 100 feet high," three-fourths of the way from Lake Erie to Lake Ontario.

De l'Isle, Guillaume. [View of Niagara Falls in the early part of the 18th century.] (*In his* Atlas nouveau, Amsterdam: N. d. Chez Jean Covenes et Corneille Mortier. P. 96a.)

The regular Hennepin view, with the dog, savages, explorers, and priest on one side, and numerous figures on the winding pathway on the other. The third falls and the fir trees are in evidence.

1705–1720

1705–20
Chatelain

Chatelain, H. A. Carte contenant le royaume du Mexique et la Floride, dressée sur les meilleures observations et sur les memoires le plus Nouveaux. (*In his* Atlas historique. [anon.] fol. Amsterdam: 1705–1720. Vol. VI. No. 27. P. 101.)

Indicates "Saut de Niagara."

Chatelain, H. A. Carte de la Nouvelle France où se voit le cours des grandes rivière de S. Laurens et de Mississipi, aujourd'hui S. Louis. (*In his* Atlas historique. [anon.] fol. Amsterdam: 1705–20. Vol. VI. No. 23, P. 91.)

Indicates "Saut de Niagara."

Chatelain, H. A. Carte très-curieuse de la Mer du Sud, contenant des remarques nouvelles & très-utiles non seulement sur les ports & iles de cette mer, mais aussi sur les principaux pais de l'Amérique tant Septentrionale que Méridionale. . . . (*In his* Atlas historique, [anon.] fol. Amsterdam: 1705–20. Vol. VI. No. 30, P. 117.)

The map "le Saut de Niagara est une Chute d'eau du lac Erie dans le lac Ontario d'une demie Lieue de Haut."

An inset shows the Saut de Niagara with "Menage et industrie des Castors" in the foreground. The view is a modified Hennepin picture, the third fall quite low, and the American and Horseshoe Fall straight across as they so often appear in these old views. 1705–20 Chatelain

CHATELAIN, H. A. Saut ou chute d'eau de Niagara. 4½ x 5. (*In his* Atlas historique. [anon.] fol. Amsterdam: 1705–20. Vol. VI. No. 24, P. 94.)

The Hennepin view with a brief description. It shows the third fall but says — "Elle est compose de deux grandes nappes d'eau et de deux avec une ile entalus au milieu."

1710

SENEX, JOHN. A new map of the English empire in America; . . . revised by John Senex. 1710. (*In* A new general atlas. Lond.: Daniel Brown. 1721. P. 237.) 1710 Senex

"The great Fall."

SENEX, JOHN. North America. Corrected from the observations communicated to the Royal Society at London, and the Royal Academy at Paris, by John Senex. 1710.

"Niagara Cataract, its fall 600 feet."

SENEX, JOHN. North America, corrected from the observations communicated to the Royal Society at London and the Royal Academy at Paris, by John Senex. 1710. (Maps of Am. Vol. III. No. 14.)

1710–1720

MOLL, HERMAN. A catalogue of a new and compleat atlas or set of twenty-six two-sheet maps. All composed and done according to the newest and most exact observations, by Herman Moll, geographer. (Buff. hist. soc. Buffalo, N. Y.) 1710–20 Moll

MOLL, HERMAN. A new and exact map of the dominions of the king King of Great Britain on ye continent of North America. . . . according to the newest and most exact observations. (*In his* The world described. fol. Lond.: 1710–1720. No. 8.)

"The Great Fall of Niagara."

The inset of the Falls gives the picture of the industrious beavers with the legend which accompanies it.

1712

1712
Moll

MOLL, HERMAN. Map of North America according to ye newest and most exact observations. . . . [1712.] (Maps of Am. Vol. I. No. 26.)

"The Great Fall of Niagara."

MOLL, HERMAN. A map of New France containing Canada, Louisiana, etc., in North America according to the patent granted by the King of France to Monsieur Crozat, dated the 14th of September, 1712, N. S. and registered in the Parliament of Paris the 24th of the same month. (*In his* Atlas geographicus: or compleat system of geography, (ancient and modern) for America. Savoy. Eli Nutt for John Nicholson. 1717. Vol. V. P. 676.)

"The Great Fall of Niagara."

1713

1713
Joutel

JOUTEL, HENRI. Carte nouvelle de la Louisiane, et de la rivière de Mississippi, découverte par feu mr. de la Salle. . . . (*In his* Journal of La Salle's last voyage. . . . Chicago: The Caxton Club. 1896.)

There were two hundred and six copies of this edition, which contains a facsimile of the map from the original French edition published in Paris in 1713. This map indicates the "Saut de Niagara," and the inset shows "Le fameux Saut de Niagara ou la Rivière de St. Laurent tombe de plus de 100 Toises de Haut."

JOUTEL, HENRI. Carte nouvelle de la Louisiane, et de la Rivère de Mississippi, découverte par feu mr. de la Salle. . . . Dressee par le S'r Joutel qui etoit de ce Voyage. 1713. (*In his* Journal of La Salle's last voyage, 1684–7. . . . New ed. Albany: J. McDonough. 1906.)

There were five hundred copies of this edition printed. The map indicates the "Saut de Niagara" as in the Caxton Club edition of 1896, and the same inset is shown.

JOUTEL, HENRI. A new map of the country of Louisiana and of ye river Missisipi in North America discover'd by monsr de la Salle in ye years 1681 and 1686, as also of several other rivers before unknown. . . . by the Sr. Joutel, who perform'd that voyage. 1713. (*In his*

Journal of the last voyage perform'd by Monsr. de la Salle. . . . 1713
Lond.: Printed by A. Bell [etc.] 1714.) Joutel

The "Cataract of Niagara" is indicated and there is a view inset showing "The famous Fall of Niagara, where ye River of St. Laurence casts itself down from a height of above 100 fathoms." This view shows the third fall on the left.

1715

MOLL, HERMAN. A new and exact map of the dominions of the king 1715
of Great Britain on ye continent of North America, containing New- Moll
foundland, New Scotland, New England, New York, New Jersey, Pensilvania, Maryland, Virginia, and Carolina. According to the newest and most exact observations. Dedicated to the Honourable Walter Douglas.

This map is the one having the large oblong inset of the "cataract of Niagara, some make this Water-Fall to be half a league while others reckon it no more than a hundred Fathom." This well-known inset is called — "A view of ye Industry of ye Beavers of Canada in making Dams to stop ye Course of a Rivulet in order to form a great lake, about which they build their habitations. To Effect this: they fell large Trees with their Teeth, in such a manner as to make them come Cross ye Rivulet, to lay ye foundation of ye Dam; they make Mortar, work up and finish ye whole with great order and wonderful Dexterity. The Beavers have two Doors to their Lodges, one to the water and the other to the Land side, according to ye French Accounts."

We are fortunate in having such wonderful "industry" preserved to us in this remarkable picture.

MOLL, HERMAN. To the Right Honourabel John Lord Sommers, Baron of Evesham in ye county of Worcester, President of Her Majesty's most honourable Privy Council etc. This map of North America according to ye newest and most exact observations is most humbly dedicated by your lordship's humble servant. (Buff. hist. soc. Buffalo, N. Y.)

The Great Fall of Niagara.

1718

DE L'ISLE, GUILLAUME. Carte de la Louisiane et du cours du 1718
Mississipi. Dressée sur un grand nombre de mémoires entrau'tres sur De l'Isle
ceux de mr le Maire. Par Guillaume Délisle de l'académie des Sciences. [1718].?

1719

1719 Chatelain — CHATELAIN, H. A. Carte du Canada ou de la Nouvelle France, & des découvertes qui y été faites. (*In his* Atlas historique. [anon.] fol. Amsterdam: 1705–20. Vol. VI. No. 20. P. 82.)

Indicates "Le Saut."

1719 Moll — MOLL, HERMAN. A new & correct map of the whole world. 1719. (*In his* The world described. fol. Lond.: 1710–20. No. 2.)

"Shewing ye situation of its Principal Parts, Viz., the Oceans Kingdoms, Rivers, Capes, Ports, Mountains, Woods, Trade-winds, Monsoons, Variation of ye Compass, Climats, etc., with the most Remarkable Tracks of the Bold Attempts which have been made to Find out the North East and North West Passages.

"The Projection of this map is call'd Mercator's, the Design is to make it Useful both for Land and Sea. And it is laid down with all possible care, according to the newest and most Exact Observations." It shows the "Great Fall of Niagara."

1720

1720 Willday — WILLDAY, GEORGE. Map of North America. H. Terasson delin. et fecit. [1720?]

"Niagara cataract, it falls 600 feet."

1722

1722 De l'Isle — DE L'ISLE, GUILLAUME. Tabula geographica Mexicae et Floridae. . . . Carte du Mexique et de la Floride. . . . dated 1722. (*In his* Atlas nouveau. Amsterdam: N. d. Chez Jean Covens et Corneille Mortier. P. 99.)

"Saut de Niagara."

1729

1729 Vander Aa — VANDER AA, PIERRE. Canada ou Nouvelle France, suivant les nouvelle observations de Messrs. de l'Academie Royale des Sciences. . . . Augmentées de Nouveau. A Leide: Chez Pierre Vander Aa. (*In* La Galerie agréable de monde. Leide: P. Vander Aa. [1729?] Vol. I. Amerique.

"Niagara le Saut."

VANDER AA, PIERRE. L'Amerique selon les Nouvelles observations de Messrs. de l'Academie des Sciences. . . . À Leide. Chez Pierre Vander Aa. [I. Goeree, delin. J. Baptist sculp.] (*In* La Galerie

agréable du monde. Leide: P. Vander Aa. [1729] Vol. I. Amerique.) 1729 Vander Aa

"Niagara–Sault d'une demie lieue."

VANDER AA, PIERRE. L'Amérique septentrionale suivant les nouvelles observations de Messrs. l'Academie Royale des Sciences. . . . Augmentées de nouveau. 8¾ x 11¾. À Leide: Chez Pierre Vander Aa. (*In* Hooge, Romein de, Les Indes orientales et occidentales et autres lieux. Leide: Pierre Vander Aa. [1680?] Pl. 9.)

Fort Niagara is indicated — so — "O" — but there is nothing to show the location of the Falls.

VANDER AA, PIERRE. Nouvelle carte de l'Amerique. . . . dressée suivant les plus nouvelles découvertes par les plus habiles géographes, et tout nouvellement mise en lumiere par Pierre Vander Aa. (*In* La Galerie agréable du monde. Leide: P. Vander Aa. [1729?] Vol. I. Amerique.)

"Sault d'eau."

1730?

MOLL, HERMAN. A new and exact map of the dominions of the king of Great Britain on ye continent of North America . . . according to the newest and most exact observations. [1730?] (Maps of Am. Vol. I. No. 12.) 1730? Moll

"The Great Fall of Niagara," also the beaver inset.

1733

Falls of Niagara. [View. 5½ x 11. Inset to Popple, Henry, A map of the British empire in America. fol. Lond.: W. H. Toms & R. W. Seale, 1733.] 1733

The Hennepin view of the Falls.

North America according to the latest observations. (*In* Gordon, Patrick, Geography anatomiz'd: or the geographical grammar. Lond.: Knapton, Knaplocke, and Co. 1733. Opp. 343.) 1733

A break shows the location of the Falls, but no name is given.

POPPLE, HENRY. America Septentrionalis. A map of the British empire in America with the French and Spanish settlements adjacent thereto. By Henry Popple. (Am. maps, Vol. II, No. 8.) 1733 Popple

The "Fall of Niagara" is shown on the map, and there is a small inset of the Hennepin view of the Falls with the usual figures and trees. This is a duplicate of No. 9 of American maps.

1733
Popple

POPPLE, HENRY. Map of America; Mariland, Pensilvania, New Jersey, New York, and the western part of Connecticut. N. d.

"The Fall of Niagara 600 feet high." The Hennepin view is also inset on this map.

POPPLE, HENRY. A map of the British empire in America. fol. Lond.: W. H. Toms & R. W. Seale. 1733.

Contains also the Hennepin inset.

POPPLE, HENRY. A map of the British empire in America with the French and Spanish settlements adjacent thereto. (Maps of Am. I. No. 17.)

The Hennepin inset.

POPPLE, HENRY. A map of the British empire in America, with the French, Spanish and Dutch settlements adjacent thereto. Certified by Edmund Halley. Amsterdam: Covens and Mortier. N. d.

"Falls of Niagara" are shown as too near Lake Ontario. The Hennepin inset is very small.

1737

1737
Bernard

BERNARD, J. F. Le cours du fleuve Mississipi, selon les relations les plus modernes. Amsterdam: Chez J. F. Bernard. 1737.

1739–1742

1739–42
La France

LA FRANCE, JOSEPH. A new map of part of North America from the latitude of 40 to 68 degrees. 12½ x 18½. (*In* Dobbs, Arthur, Remarks upon Capt. Middleton's defence. Lond.: 1744. Opp. p. 1.)

"as descrived by Joseph L France a French Canadese Indian, who traveled thro those Countries and Lakes for three uears from 1739 to 1742." The "Great Fall of Niagara" is indicated by name, but the map is not a good one, the proportions being poor.

1740–1750

1740–50
De l'Isle

DE L'ISLE, GUILLAUME. Carta geografica del Canada nell' America Settentrionale. (Atlante Novissimo Del Sig'r Guglielmo de L'Isle. Venezia: Giambatista Albrizzi I. Girol. 1740. [1740–1750.] Vol. I–II. [No. 40.])

"Niagara il salto" indicated.

1743

BELLIN, N——. Carte de l'Amérique Septentrionale. 1743. (*In* Charlevoix, Pierre Francois Xavier de, Histoire de la nouvelle France. À Paris: Chez Nyon fils. 1744. Vol. I. Frant.) 1743 Bellin

A break indicates the Falls, but no name is given.

BELLIN, N——. Carte de l'Amérique Septentrionale. 1743. (*In* Charlevoix, Pierre Francois Xavier de, History and general description of New France, ed. by J. G. Shea. N. Y.: Harper. 1900. Vol. I. P. 100.)

A break indicates the Falls.

1744

BELLIN, N——. Carte de la Louisiane, cours du Mississipi et pais voisins. Dediée a M. Le Comte de Maurepas, Ministre et Secretaire d'Etat Commandeur des Ordres du Roy. Par N. Bellin. Ingenieur de la Marine. 1744. 1744 Bellin

Sault de Niagara.

BELLIN, N——. Carte de la Louisiane, cours du Mississipi et pays voisins. 1744. (*In* Charlevoix, Pierre Francois Xavier de, Histoire et description générale de la Nouvelle France. A Paris: Chez Nyon fils. 1744. Vol. II. Front.)

"Sault de Niagara."

BELLIN, N——. Carte de la Louisiane, cours du Mississipi et pais voisions. 1744. (*In* Charlevoix, Pierre Francois, History and general description of New France, ed. by J. G. Shea. N. Y.: Harper. 1900. Vol. VI. Pp. 10–11.)

"Sault de Niagara."

BELLIN, N——. Carte des lacs du Canada. (*In* Charlevoix, Pierre Francois Xavier de, Histoire de la Nouvelle France. A Paris: Chez Nyon fils. 1744. Vol. III. Pp. 276–277.)

"Sault de Niagara de 250 pieds au plus."

BELLIN, N——. Carte de l'ocean occidental et Parite de l'Amerique Septentrionale. 1744. (*In* Charlevoix, Pierre Francois Xavier de, Histoire de la Nouvelle France. A Paris: Chez Nyon fils. 1744. Vol. III. Front.)

"Chute de Niagara."

1744
Bellin

BELLIN, N——. Karte des abendlaendischen weltmeeres, und eines theils von dem mitternaechigen America: gezeichnet zum nähern verständniss der im jahr 1720 gethanen reise des ehre: vaters de Charlevoix priesters der gesellschafft Jesu, in die länder Canada, Louisiana und San Domingo: durch N. Bellin. 1744. 8½ x 14½. (*In* Schröter, Johann Friederich, Allgemeine geshichte der länder und völker von America. Nebst einer vorrede Siegmund Jacob Baumgartens. (anon.) Halle: J. J. Gebauer. 1753. Vol. II. P. 478.)

"Sault de Niagara" indicated.

1746

1746
Anville

ANVILLE, JEAN BAPTISTE BOURGUIGNON D'. Amérique Septentrionale. 1746. (*In his* Atlas général. 1727–80. No. 10.)

"Saut de Niagara."

1746
Boehmio

BOEHMIO, AUGUST GOTTLIEB. Americae mappa generalis secundum legitimas projectionis stereographicae regulas relationesque recentissimas et observationes sociorū acad. reg. sequae Parisiis est aliorumque auctorum nec non secundum mentem D. I. M. Hasii m. p. p. in partes suas methodicas divisa nunc concinnata et delineata ab Aug. Gottl. Boehmio. Phila. mag. istro. (Maps of Am., Vol. I, No. 18.)

A break shows the cataract.

1746
Southack

SOUTHACK, ———. A new chart of the British empire in North America; with the distinct colonies granted by letters patent from cape Canso to St. Matthias river. 1746.

"The Great Falls" indicated.

1747

1747
Kitchin

KITCHIN, THOMAS. A map of the French settlements in North America. 7 x 7. (*In the* London mag. Lond.: For R. Baldwin. Dec. 1747. 16: Opp. p. 543.)

A break indicates the site of the Falls, but no name is given to them.

KITCHIN, THOMAS. North America, wherein are particularly distinguished the British dominions, the United States, and the adjacent Spanish territories. (*In* Mills, David. A report on the boundaries of Ontario. Toronto: 1873.)

This map by Kitchin "hydrographer to His Majesty" shows the "Great Fall of Niagara 175 feet."

1749

BOWEN, EMANUEL. A map of the British American plantations, extending from Boston in New England to Georgia, including all the back settlements in the respective provinces as far as the Mississipi. 8½ x 11. (*In the* London mag. Lond.: For J. Astley. [1749] July, 1749. 18: Opp. p. 308.) 1749 Bowen

"Fall of Niagara 600 feet."

SANSON, N—— and G——. L'Amérique Septentrionale et Méridionale divisée en ses principales parties par les srs. Sanson . . . rectifée suivant les nouvelles découvertes . . . aux observations astronomiques par le sr. Robert. 1749. (Am. maps. Vol. II, No. 19.) 1749 Sanson

"Saut de Niagara."

1750

KALM, PETER. A letter from Mr. Kalm, a gentleman of Sweden, now on his travels in America, to his friend in Philadelphia, containing a particular account of the Great Fall of Niagara, September 2, 1750. (Gentleman's mag., Jan., 1751. 21:15–19.) 1750 Kalm

The view of Niagara Falls, which was designed to accompany Mr. Kalm's letter, was not published in the Gentleman's Magazine until the next month after his article appeared, namely in February, 1751. Although Kalm himself may have had nothing to do with the actual making of the picture, it is quite evident that the engraver founded his work on the author's description. It is the first picture after Hennepin's to be founded on an actual sight of the Falls.

(KALM, PETER.) A view of the famous cataract of Niagara in North America. (Grosvenor library, Buffalo, N. Y. Views of Niagara Falls. 1697–187–. Mat 2.)

Taken from the Gentleman's Magazine of February, 1751.

1751

De berugte Waterval van Niagara in New York. (Grosvenor library, Buffalo, N. Y. Views of Niagara Falls, 1697–187 Mat. 2.) 1751

No information is obtainable as to where this view was published or when, but it is quite apparent that it is founded on the plate illustrating Kalm's letter published in 1751.

1751 Kalm

KALM, PETER. Facsimile from Kalm, A. D. 1750. "XX." Engraved for Ingraham's "Description of Niagara."

This print after Kalm shows three feathery trees on Goat Island, and others on the main shores. On the American side are seen explorers and the usual dog, and on a pathway on the Canadian side are to be seen a number of persons. There is a ladder on the face of Goat Island, and waterfowl are shown in the rapids above the Falls. The legend of the picture tells us:

a. "The place where a piece of Rock was broken from, which while standing turn'd the Water obliquely across the Falls as in Popple's map."

b. "Two men passing over the east stream with staves."

c. "The Indians reascending their Ladder."

1752

1752 Bowen

BOWEN, EMANUEL. A new and accurate map of Louisiana with part of Florida and Canada. (*In his* Complete atlas, or distinct view of the known world. 1752. No. 57.)

"Fall of Niagara."

1753

1753

A map of the British and French settlements in North America (part the first); containing Canada, Nova Scotia, Newfoundland, New England, part of New York, with the lakes, six nations, and all the countries westward in the same parallels so far as discover'd; exhibiting the just boundaries, and the French encroachments: laid down from authentic surveys. [1753?] (Am. maps. II. No. 10.)

Shows the "Fall of Niagara, 150 feet" in height. Taken from the General magazine, 1754.

1754

1754

(An) accurate map of the English colonies in North America bordering on the river Ohio. 8 x 9½. (*In the* Universal mag. Lond.: J. Hinton. 1754. 15: 241.)

"Fall of Niagara 160 feet."

1755

1755 Anville

ANVILLE, JEAN BAPTISTE BOURGUIGNON D'. Canada, Louisiane et terres Angloises. (*In his* Atlas général. 1727–80. No. 32.)

"Saut de Niagara."

BOWEN, EMANUEL, *and* GIBSON, JOHN. An accurate map of North America, describing and distinguishing the British and Spanish dominions. . . . also all the West India Islands. . . . (Am. maps. II. No. 26–27) 1755 Bowen & Gibson

"Falls of Niagara 140 feet."

BOWEN, EMANUEL, *and* GIBSON, JOHN. An accurate map of North America. Describing and distinguishing the British, Spanish and French dominions on this great continent, exhibiting the present seat of war and the French encroachments; also all the West India islands. . . . [1755?] (Am. maps I. No. 20.)

"Falls of Niagara, 140 feet."

EVANS, LEWIS. A general map of the middle British colonies, in America: viz., Virginia, Mariland, Delaware, Pensilvania, New Jersey, New York, Connecticut and Rhode Island, of Aquanishuonigy, the country of the confederate Indians . . . comprehending their beaver hunting countries, of Lakes Erie, Ontario, and Champlain. . . . Carefully copied from the original published at Philadelphia. . . . Lond.: Printed for John Bowles. (*In* Evans, Lewis, Geographical, historical, political, philosophical and mechanical essays. . . . Phila.: Printed by B. Franklin *and* D. Hall. 1755. P. 32.) 1755 Evans

The first of these essays contains "an analysis of a general map of the middle British colonies in America, and of the country of the confederate Indians: a description of the face of the country; the boundaries of the confederates; and the maritime and inland navigations of the several rivers and lakes contained therein."

On page 18, we read that "The streight of *Oghniagara* between the lake Ontario and Erie, is easily passable some five or six miles with any Ships, or ten miles in all with Canoes; then you are obliged to make a Portage up three pretty sharp Hills about eight Miles, where there is now cut a pretty good Cart-way. This portage is made to avoid that stupendous fall of Oghniagara, which in one Place precipitates headlong five or six and twenty Fathoms, and continues for six or seven Miles more to tumble in little Falls, and run with inconceivable Rapidity, and indeed the Streight for a Mile or two is so rapid, above the Fall, that it is not safe venturing near it."

A map of the British and French settlements in North America. 11 x 15. (*In the* Universal mag. Lond.: J. Hinton. 1755. 17: P. 145.) 1755

A break shows the location of the Falls.

1755 A map of the five great lakes, with part of Pensilvania, New York, Canada and Hudson bay territories, etc. [anon.] 8½ x 10. (*In the* London mag. Lond.: For R. Baldwin. Sept. 1755. 24: opp. p. 432.)

A break shows the "Fall of Niagara."

1755 A new and accurate map of the English empire in North America, representing their rightful claim as confirm'd by charters and the formal surrender of their Indian friends; likewise the encroachments of the French, with several forts they have unjustly created therein. By a Society of antigallicans. Sold by W. Herbert and Robert Sayer. Lond.: 1755. (Am. maps. II. No. 21.)

"Falls of Niagara."

1755 Ottens OTTENS, R. *and* J. Carte des possessions Angloises et Françoises du continent de l'Amérique Septentrionale.—Kaart van de Engelsche en Fransche bezittingen in hets vaste land van Noord America, 1755. A Amsterdam: Chez R. et J. Ottens.

"Saut de Niagara."

1755 Sault du Niagara de 135 pieds de haut. Vue. [From "Recueil des plans de l'Amerique Septentrionale. A Paris: chez le sr. Rouge. 1755 at end.]

The Hennepin view with no dog.

1755 Sault du Niagara de 135 pieds de haut. [Paris, 1755.] (Grosvenor library, Buffalo, N. Y. Views of Niagara Falls, 1697–187–.)

1755–1760

1755–60 Overton OVERTON, HENRY. A map of the British plantations on the continent of North America, according to the notes and improvements of mr. Bolton, made in the original of mr. Danville with the history of each colony in the margin. . . . [1755–1760.]

"Fall of Niagara, 168 feet."

1756

1756 Anville ANVILLE, JEAN BAPTISTE BOURGUIGNON D'. America Septentrionalis a domino d'Anville in Galliis edita nunc in Anglia coloniis in interiorem Virginiam deductis nec non fluvii Ohio. . . . geographicis et historicis illustrata sumptibus Homannianorum Heredum Noribergae ao 1756.

"Fall of Niagara."

THE AMERICAN FALLS, GOAT ISLAND AND THE HORSESHOE FALLS

Taken just below Prospect Point

1758

EVANS, LEWIS. A general map of the middle British colonies in America; . . . carefully copied from the original published at Philadelphia in 1755, with some additions by J. Gibson. 1758 Evans

This map showing "Ochniagara Falls" was published in London in 1758 by Jefferys from the edition of 1755.

HARREVELT, E—— VAN. Wasserfall von Niagara. 7 x 10. (*In his* Allgemeine histoire des reisen zu wasser und lande. Leipzig. Arkstee und Merku. 1758. 16:684.) 1758 Harrevelt

Opposite page 680 is a "Karte von den Seen in Canada, von M. B." which indicates Niagara, and on pages 683–685 is a description. In the Hennepin view given with this map, the view of the Falls is reversed, the trees are smaller, and the little dog is missing.

1759

PALAIRET, I——. Carte des possessions Angloises et Françoises du continent de l'Amérique Septentrionale. Londres: 1759. (Am. maps. Vol. II. No. 23.) 1759 Palairet

"Saut de Niagara."

ANVILLE, JEAN BAPTISTE BOURGUIGNON D'. North America, from the French of mr. D'Anville. Improved with the back settlements of Virginia and course of Ohio. . . . (*In* Jefferys, Thomas, The natural and civil history of the French dominion in North and South America. Lond.: 1760. Pt. I. Opp. p. 134.) 1759 Anville

"Fall of Niagara."

1760

DAVIES, THOMAS. An east view of the great cataract of Niagara. Engraved on copper by J. Foregeron. 1760. 1760 Davies

"To his Excellency Lieut. Gen. Sir Jeffrey Amherst, Knight of the Most honourable order of the Bath. . . ."

"Drawn on the spot by Thomas Davies, Capt. Lieut. Royal Reg't of Artillery."

This peculiar view shows a little of the Canadian rapids, both islands, the whole of both Falls and a rainbow like a cartwheel. The river below the Falls is like a pond and on the left are two savages painting. With all its crudities, the drawing comes nearer the real Niagara than the Hennepin view which preceded it.

1760 Jefferys

JEFFERYS, THOMAS. A map of Canada and the northern part of Louisiana with the adjacent countrys. (*In his* The natural and civil history of the French dominion in North and South America. Lond.: 1760. Pt. I. Front.)

"Niagara Fall."

1761

1761 Seale

SEALE, R. W. (del. & sc.) An accurate map of Canada, with the adjacent countries, exhibiting the late seat of war between the English & French in those parts. [anon.] 10 x 13½. (*In the* Universal mag. Lond.: J. Hinton. Feb., 1761. 28: Opp. p. 57.)

"Niagara Fall" indicated.

1762

1762 Jefferys

JEFFERYS, THOMAS. A map of Canada and the northern part of Louisiana with the adjacent countrys. 11½ x 15. (*In* Mills, David, A report on the boundaries of Ontario. Toronto: 1873.)

A map by Jefferys "Geographer to His Majesty," 1762, published in London. It shows "Niagara Falls."

1763

1763 Anville

ANVILLE, JEAN BAPTISTE BOURGUIGNON D'. North America from the French of mr. D'Anville. Improved with the English surveys made since the Peace. 1763. (*In* Mills, David, A report on the boundaries of Ontario. Toronto: 1873.)

"Fall of Niagara."

1763

(A) new map of North America from the latest discoveries. 1763. (anon.) 11 x 15. (*In the* London mag. Lond.: For R. Baldwin. Feb., 1763. 32: Opp. p. 64.)

Break shows "Niagara Fall."

1763 Sayer

SAYER, ROBERT. An accurate map of North America, describing and distinguishing the British and French dominions on the great continent according to the definitive treaty concluded at Paris, 10 February, 1763.

"Fall of Niagara."

1763

A new and accurate map of North America, laid down according to the latest, and most approved observations and discoveries. [anon.] 10 x 13. (*In the* Universal mag. Lond.: J. Hinton. Mar., 1763. 32: Opp. p. 113.)

"Fall of Niagara 100 feet."

TERRENI, G. M. Caduta di Niagara. G. M. T. (sc.) 9½ x 7¼. (*In* Il Gazzettiere Americano. Livorno: M. Coltellini. 1763. Vol. 3. P. 5.) 1763 Terreni

A Hennepin view with the dog. There is also a brief encyclopaedic description giving the height, swiftness (animals carried over), the dividing islands, and an account of the mist.

TERRENI, G. M. Caduta di Niagara. G. M. T. fecit. (Grosvenor library, Buffalo, N. Y. Views of Niagara Falls. 1697–187–. Mat 2.)

From "Il Gazzettiere Americano."

TERRENI, G. M. Caduta de Niagara. 9½ x 7. (*In* Atlante dell' America. [anon.] Liverno: Presso Gio Tomasso Masi e comp. con approvazione. 1777. No. 6.)

View of the fall of Niagara. (Grosvenor library, Buffalo, N. Y. Views of Niagara Falls. 1697–187–. Mat 2.) 1763

Hennepin type. No third fall.

1764

BELLIN, J. N. Carte des cinq grands lacs du Canada. (*In his* Le petit atlas maritime. . . . 1764. Vol. 1. No. 6.) 1764 Bellin

"Le Sault."

BELLIN, J. N. La nouvelle France ou Canada. (*In his* Le petit atlas maritime. Receuil de cartes et plans des quatre parties du monde. Par le S. Bellin. 1764. Vol. I. No. 4.)

"Sault de Niagara."

1766

ROBERT, SR. ——. A part of North America comprehending the course of the Ohio, New England, New York, New Jersey, Pensilvania, Maryland, Virginia, Carolina and Georgia. From the Sr. Robert with improvements. (*In* Brookes, R., General gazetteer. Lond.: For J. Newberry. 1766.) 1766 Robert

Shows a "Niagara Fall 140 feet," with a brief encyclopaedic notice. "In this river there is a large cataract which has been reported to have been the greatest in the world, and that the mist which this occasions, may be seen at 15 miles distance; but this is a great mistake; however, the waters fall from a rock 140 feet high, make a noise like thunder heard at a great distance."

1767

1767 ——— ———. Niagara. (*In* Billardon de Sauvigny, Edme Louis. Hirza, ou Les Illinois, tragedie. Paris: Le veuve Duchesne. 1780. Frontispiece.

A "Niagara" unrecognizable except for the legend beneath is used as a background for a rocky tomb and a number of warlike aborigines.

1768

1768 Anville ANVILLE, JEAN BAPTISTE BOURGUIGNON D'. North America. From the French of mr. d'Anville. Improved with the back settlements of Virginia and the course of the Ohio. Illustrated with geographical and historical remarks. (*In* Jefferys, Thomas, General topography of North America and the West Indies. . . . Lond.: Printed for Robert Sayer and Thos. Jefferys. 1768. No. 7.)

"Fall of Niagara."

1768 Bowen & Gibson BOWEN, EMANUEL, *and* GIBSON, JOHN. An accurate map of North America. Describing and distinguishing the British, Spanish and French dominions on this great continent; according to the definitive treaty concluded at Paris 10 feb. 1763. (*In* Jefferys, Thomas, General topography of North America and the West Indies. Lond.: Printed for Robert Sayer and Thomas Jefferys. 1768. No. 9.)

"Falls of Niagara 140 feet."

1768 De Waterval van Niagara. (Grosvenor library, Buffalo, N. Y. Views at Niagara Falls. 1697–187–. Mat 3.)

A copy of Pierie, but the figures in the foreground are slightly different.

1768 Evans EVANS, LEWIS. A general map of the middle British colonies in America: viz. Virginia, Maryland, Delaware, Pensilvania, New Jersey, New York, Connecticut, and Rhode Island, of Aquanishuonigy the country of the confederate Indians. . . . Corrected and improved with the addition of the line of forts on the back settlements by Thos. Jefferys. (*In* Jefferys, Thomas, General topography of North America and the West Indies. Lond.: Printed for Robert Sayer and Thomas Jefferys. 1768. No. 32.)

1768 Jefferys JEFFERYS, THOMAS. Chart of the Atlantic ocean, with the British, French, & Spanish settlements in North America, and the West Indies; as also on the coast of Africa. (*In his* General topography of North

America and the West Indies. Lond.: Printed for Robert Sayer and Thomas Jefferys. 1768. No. 13.) **1768 Jefferys**

"Niagara."

JOHNSON, GUY. Map of the frontiers of the northern colonies with the boundary line established between them and the Indians at the treaty held by S. Will Johnson at Fort Stanwix in nov. 1768. (*In* O'Callaghan, E. B., Documentary history of the state of New York. Albany: 1850. 1:376.) **1768 Johnson**

This map "was corrected and improved from Evans' map by Guy Johnson, Department Agent of Indian Affairs." Great Fall" is indicated only by a break in the rocks.

JOHNSON, GUY. Map of the frontiers of the northern colonies with the boundary line established between them and the Indians at the treaty held by S. Will Johnson at Ft. Stanwix in nov. 1768. (*In* Mills, David, A report on the boundaries of Ontario. Toronto: 1873.)

Like the map in O'Callaghan's "Documentary history" this is also "corrected and improved" from Evans's map by Guy Johnson.

PIERIE, WILLIAM. View of the cataract of Niagara, from a drawing taken on the spot by Lt. Pierie of the Royal Artillery. Richard Wilson Pinx. William Byrne (sc.) 1768. **1768 Pierie**

This is the first picture of the Falls which gives anything like an accurate representation of their real appearance. The point of view is from the high land on the Canadian side and includes both falls. The shores are shown as level and true to nature, and the outline of the Horseshoe is approximately as it is today, with perhaps a little less water, and changes in contour which a hundred and fifty years might easily bring about.

To the Right Hon.ble Lady Susan O'Brien, this view of the cataract of Niagara, with the country adjacent is most humbly Inscribed by her Ladyship's most obed't and Obliged hble Serv't
William Pierie.

This stupendous cataract is near a mile wide, and falls over a perpendicular Rock of 170 Feet high, which interrupts the Passage of the River Niagara for some miles, between the Lakes Erie and Ontario, on the Frontiers of the Province of New York in North America.

1763
Pierie

Published according to Act of Parliament, 28th February, 1774 by the Author and sold for him at Mr. Dodsley's, Pall Mall, and Mr. Knox's in the Strand.

1768
Schumann

SCHUMANN, I——. (sc.) Total Anblick des Niagara Falls. (Grosvenor library, Buffalo, N. Y. Views of Niagara Falls. 1697–187–. Mat 3.)

Copy of Pierie.

1768
Wilson

WILSON, ROBERT. Niagara Falls — Horseshoe. 15 x 21. Eng. by William Byrne. 1768.

An old-time engraving. Another copy published in 1774 by the author has the text in the margin.

1771

1771
Evans

EVANS, LEWIS. A general map of the middle British colonies in America. . . . Carefully copied from the original published at Philadelphia. Lond.: For John Bowles. 1771. (Am. maps, Vol. V, No. 16.)

"Ochniagara Falls."

1771
Johnson

JOHNSON, GUY. The country of the six nations proper, with part of the adjacent colonies. (*In* O'Callaghan, E. B., Documentary history of the state of New York. Albany: 1849. Vol. IV. P. 660.)

The "Great Falls" are indicated but are rather too far down the river.

JOHNSON, GUY. Map of the country of the six nations. (*In* Pouchot, M——, Memoir upon the late war in North America. . . . Roxbury, Mass.: W. Elliot Woodard. 1866. Vol. II. P. 148.)

This map of Johnson's made in 1771 shows the "Great Falls" as too near Lake Ontario.

1774

1774
Harrevelt

HARREVELT, E——VAN. Cataracte de Niagara. N. v. d. Meer jun.s. 7 x 10. (*In his* Histoire générale des voyages. A. Amsterdam: 1774. 21:456.)

"This map differs somewhat from the one published in the German translation entitled 'Allgemeine historie der reisen zu wasser und lande, 1758' Vol. 16, P. 684." The French version contains also a Hennepin view, and on pages 456–457 is a description of the Falls.

HARREVELT, E——VAN. Carte de la Nouvelle Angleterre, Nouvelle York et Pensilvanie. (*In his* Histoire générale des voyages. A. Amsterdam: 1774. 21:263.) 1774 Harrevelt

"Sault de Niagara" indicated.

HARREVELT, E——VAN. Carte des lacs du Canada. (*In his* Histoire générale des voyages. A. Amsterdam. 1774. 21:452.)

1777

BEAURAIN, CHR. DE. Carte de l'Amerique Sept'le pour servir à l'intelligence de la guerre entre les Anglois et les Insurgents Dediée à Mgr. de Sartine, Ministre de la Marine par M. le Chr. de Beaurain. Geographe du Roi, et son pensionnaire. 1777. 1777 Beaurain

"Sault de Niagara."

Carta della nuova Inghilterra, Nuova York, e Pensilvania. (*In* Atlante dell' America. [anon.] Liverno: Presso Gio Tomasso Masi, e comp. con approvazione. 1777. No. 2.) 1777

Indicates the location of the Falls.

Carta rappresentante i cinque Laghi del Canada. (*In* Talante dell' America. [anon.] Liverno: Presso Gio Tomasso Masi, E comp. con approvazione. 1777. No. 5.) 1777

Indicates the location of the Falls.

1779

MIDDLETON, CHARLES THEODORE. The great cataract or waterfall of Niagara in North America. 6½ x 10½. (*In his* A new and complete system of geography. fol. Lond.: For J. Cook. 1779. Vol. II. P. 505.) 1779 Middleton

1782

(The) most surprising cataract of Niagara in Canada. Engraved for Millar's New and complete universal system of geography. (Grosvenor library, Buffalo, N. Y. Views of Niagara Falls. 1697–187–. Mat 3.) 1782

This work was published by George Henry Millar in 1782. The engraving is a Kalm.

1783

HEATH, JAMES. (eng.) The Falls of Niagara. (Grosvenor library, Buffalo, N. Y. Views of Niagara Falls. 1697–187–. Mat 3.) 1783 Heath

1783 Heath

This picture by James Heath, the celebrated English engraver (Metz. del.) was probably taken from the "Novelists' magazine" published in London, 1780–1788 by Harrison and Co. It is of the Hennepin type.

1783 Metz

METZ, ——. (del.) The Falls of Niagara. Heath (sc.) Published as the Act directs by Harrison & Co. April, 1783.

1785

1785 Crévéceour

CRÉVÉCEOUR, HECTOR ST. JOHN DE. Description of Niagara Falls in a letter to his son under date of July, 1785. (Mag. of Am. hist., Oct. 1878. 2: part 2. 606–613.)

The author made an excursion to Niagara Falls in 1785, and described the cataract in a letter to his son Alexander, then 14 years old. Copies of the narrative and the map illustrating it were furnished by his great grandson. He gives a "graphic description of the cataract as it appeared in its primeval grandeur," and his chart of the river from Lake Erie to Lake Ontario is "remarkably correct." "He must have been a skilfull engineer and draughtsman to have produced so accurate a map without actual survey." At the time of his visit, there was already a saw-mill by the rapids on the American side.

1790

1790 Anville

ANVILLE, JEAN BAPTISTE BOURGUIGNON D'. A particular map of the American lakes, rivers, etc. Par le Sr. d'Anville de l'Academie R'le des Inscriptions de Belles Lettres et de celle des Sciences de Petersbourg. Secretaire de M'gr. le Duc d'Orleans. Lond.: Drawn and engraved for John Harrison, June 25, 1790. (Grosvenor library, Buffalo, N. Y. Maps historical and miscellaneous. No. 82.)

". . . Reputation and merit of this work chiefly depended upon the Labour of D'Anville and expense of the Duke of Orleans." "The Saut de Niagara" is marked.

1790 Ellicott

ELLICOTT, ANDREW. View of the Falls of Niagara. Thackera & Vallande (sc.) 1790.

This print in black and white is the earliest known picture of Niagara by an American. The drawing is inaccurate. The country around the Falls is shown as hilly and there in no indication of Luna Island. The proportions of the American and Horseshoe Falls are so drawn that the American Fall looks broader than the Horseshoe. Although an improvement on the Hennepin and Kalm views, this picture is inferior to Lieut.

Pierie's of a much earlier date. The drawing accompanies the various publications of Ellicott's letter to Dr. Rush, dated December 10, 1789. **1790** Ellicott

ELLICOTT, ANDREW. View of the Falls of Niagara. 3¾ x7. (S. Hill, eng.) (Mass. mag. Boston: I. Thomas. July, 1790. 2:387.)

ELLICOTT, ANDREW. View of the Falls of Niagara. (Columbian mag., June, 1790. 4:331.)

ELLICOTT, ANDREW. View of the Falls of Niagara. (Mag. of Am. hist., July, 1880. 5:55.)

HILL, S——. View of the Falls of Niagara. (Grosvenor library, Buffalo, N. Y. Views of Niagara Falls. 1697–187–. Mat 3.) **1790** Hill

This plate was taken from the " Massachusetts magazine " 1790. Vol. 2, page 388.

1792

SIMCOE, *Mrs.* E. G. P. Niagara paintings. (*In her* Diary of Mrs. John Graves Simcoe. . . . Toronto: Briggs. 1911.) **1792** Simcoe

These pictures illustrating Mrs. Simcoe's account of her residence on the Niagara are interesting for their historical details.

1794

HANCOCK, R——. The waterfall of Niagara. Published by Laurie & Whittle, 53 Fleet St., Lond.: 12 May, 1794. **1794** Hancock

This most surprising cataract of nature is 137 feet high and its breadth about 360 yards. The Island in the middle is about 420 yards long and 40 yards broad, at is lower End. The Water, on its approaching the said Island, becomes so rapid as almost to exceed an Arrow in swiftness till it comes to the Fall; where it reascends into the Air, foaming as white as Milk, and all in motion like a boiling Cauldron: Its noise may be heard 15 Leagues off, and in Calm Weather, its Vapours rise a great hight into the air, and may be seen like thick Smoak at 30 miles distance.

This print is based on Hennepin (1697) and Kalm (1750). Rocks and firs are shown, and the familiar little dog appears as well as groups of savages on both sides of the Falls.

A new map of North America, with the West India Islands. Divided according to the preliminary articles of peace, signed at Versailles, 2 **1794**

1794 January, 1783, wherein are particularly distinguished the United States and the several provinces, governments, etc. which compose the British dominions, laid down according to the latest surveys, and corrected from the original materials, of Governor Pownall, member of Parliament. Lond.: Laurie & Whittle. May 12, 1794.

Shows the "Falls of Niagara, 170 feet." May be found in the Grosvenor library, Buffalo, N. Y., in Maps, historical and miscellaneous. No. 64. Same map as No. 36–39 in American map series. II.

1794 A new map of North America, with the West Indies. . . . Laid down according to the latest surveys, and corrected from the original material of Governor Pownall. Lond.: Laurie and Whittle. 1794. (Am. maps. II. No. 36–39.)

1798

1798 Weld WELD, ISAAC. An eye sketch of the Falls of Niagara. (*In his* Travels through the states of North America and the provinces of upper and lower Canada, during the years 1795, 1796, and 1797. Lond.: Stockdale. 1799. P. 303.)

WELD, ISAAC. View of the Falls of Niagara. Published by I. Stockdale, Piccadilly, December 22, 1798.

General view of the Falls. May be found on page 315 of the 1799 edition of Weld's "Travels."

WELD, ISAAC. (delt.) View of the Falls of Niagara. Published December 22, 1798 by I. Stockdale. Piccadilly. (Grosvenor library, Buffalo, N. Y. Views of Niagara Falls. 1697–187–. Mat 4.)

WELD, ISAAC. View of the Horse-Shoe Fall of Niagara. Neagle, (sc.) Published by I. Stockdale. Piccadilly, December 3, 1798.

This view may be found on page 313 of the 1799 edition of Weld's "Travels through the states of North America."

WELD, ISAAC. (delt.) I. Scott, (sc.) View of the Horse-Shoe Fall of Niagara. Lond.: Jones and Co. September 1, 1824. (Grosvenor library, Buffalo, N. Y. Views of Niagara Falls. 1697–187–. Mat 4.)

WELD, ISAAC. (delt.) Neagle, (sc.) View of the Horse-Shoe Fall of Niagara. Published December 5, 1798 by I. Stockdale. Piccadilly. (Grosvenor library, Buffalo, N. Y. Views of Niagara Falls. 1697–187–. Mat 4.)

WELD, ISAAC. View of the lesser fall of Niagara. I. Scott, (sc.) Published by I. Stockdale. Piccadilly. December 22, 1798. 1798 Weld

Shows the American Fall and may be found on page 314 of Weld's "Travels."

WELD, ISAAC. (delt.) I. Scott, (sc.) View of the lesser fall of Niagara. Published December 22, 1798 by I. Stockdale. Piccadilly. (Grosvenor library, Buffalo, N. Y. Views of Niagara Falls. 1697–187–. Mat 4.)

WELD, ISAAC. Mariage (sc.) Vue de la Chute du Fer a Cheval, *also* Ensemble du Saut de la Riviére de Niagara (scarce) *and* Vue de la petite Chute. (Grosvenor library, Buffalo, N. Y. Views of Niagara Falls. 1697–187–. Mat 5.)

Weld, Isaac, Jr. (1744–1856) was an Englishman, a landscape painter by profession, who traveled in America in 1795–97 accompanied by a faithful servant, sometimes on horseback, sometimes on foot or in a canoe. His travels, published in 1799, met with great success, and went through several editions. The French version from which most of the above plates were taken was published with reduced copies of the original plates.

It seems that there must also have been an Italian editon in which the artists adorned the landscape with pale trees.

1799?

Fall des Niagara. (Grosvenor library, Buffalo, N. Y. Views of Niagara Falls. 1697–187–. Mat 4.) **1799?**

A Weld.

FUMUGALLI, P——. Niagara. (Grosvenor library, Buffalo, N. Y. Views of Niagara Falls. 1697–187–. Mat 5.) **1799?** Fumugalli

A beautiful thing in delicate color, after Weld. Shows palm trees.

Grande Chute du Niagara. (163 P. de Haut.) (Grosvenor library, Buffalo, N. Y. Views of Niagara Falls. 1697–187–. Mat 5.) **1799?**

A Weld, looks like a water color.

Petite Chute du Niagara. (162 P. de Haut.) (Grosvenor library, Buffalo, N. Y. Views of Niagara Falls. 1697–187–. Mat 5.) **1799?**

Another Weld, which looks like a water color.

1799 Rossi

Rossi, L. A. (inc.) A. Biasoli (acq.) Two views — one of Horseshoe and one of American Fall. (Grosvenor library, Buffalo, N. Y. 1697–187–. Mat 5.)

These two views in color look like water colors and are after Weld.

1800

1800 Barralet

Barralet, John James. (del.) Lawson, (sc.) Views of the Falls of Niagara. (Grosvenor library, Buffalo, N. Y. Views of Niagara Falls. 1697–187–. Mat 7.)

This was drawn by Barralet who was of French extraction, although born in Dublin. He came to America in 1795, where he died in 1812.

1800

———, ———. Death of Washington, with Niagara as a background. (1800?)

An aquatint.

1800 Maude

Maude, John. Visit to the falls of Niagara in 1800. Lond.: Longman, Rees, Orme, Brown, and Green. 1826. Pp. 131–159.

The copper plate engravings of the author which illustrate the Niagara portion of his narrative are attractive, if not notable for their accuracy. There is "An Engraved Title, with a Vigneete View of the Falls of Niagara, as seen from a Cavern;" "A View of the Falls of Niagara, with the Rapids, and Goat Island, from the Canada side of the River." "A View of Niagara with Goat Island and Rapids, from the United States side," and the "Great Horseshoe Fall of Niagara with Table Rock, as seen from below." All these illustrations show the banks much more heavily wooded than we see them today.

1800

Veduta della Cascata a ferro de Cavallo, etc. Berniere (inc.) 1800? (Grosvenor library, Buffalo, N. Y. Views of Niagara Falls. 1697–187–. Mat 5.)

1800

Veduta Generale della Cascata di Niagara. Berniere. (inc.) 1800? (Grosvenor library, Buffalo, N. Y. Views of Niagara Falls. 1697–187–. Mat 5.)

1800 Volney

Volney, Constantin Francois Chasseboeuf *Comte de.* Section of Niagara at the middle of the stream and course of the St. Lawrence at Niagara taken from "Views of the climate and soil of the United States of America in 1804." (Grosvenor library, Buffalo, N. Y. Views of Niagara Falls. 1697–187–. Mat 6.)

This French savant (1757–182–) visited Niagara in 1796, the year Great Britain relinquished her hold on the American side of Niagara and the lakes. 1800 Volney

1801

"BONFILS." Vue d'une partie des deux Branches de la Cataracte de Niagara; *and* Vue d'une partie de la Branche Occidentale de la Cataracte de Niagara. (*In* Crevecouer, H. St. John de, Voyage dans la haute Pensilvanie et dans l'etat de New York, par un membre adoptif de la nation Oneida. . . . Paris: De Crapulet 1801. Vol. II. Pp. 148–193.) 1891 "Bonfils"

"BONFILS." Vue d'une partie des deux Branches de la Cataracte de Niagara; *and* Vue d'une partie de la Branche Occidentale de la Cataracte de Niagara. (Grosvenor library, Buffalo, N. Y. Views of Niagara Falls. 1697–1187–. Mat 7.)

HERIOT, GEORGE. View of the Falls of Niagara, from the bank near Birche's Mills and view of the Falls of Niagara from beneath the bank on the Fort Schlausser side. F. C. Lewis (sc.) Printed for Richard Phillips, London. (Grosvenor library, Buffalo, N. Y. Views of Niagara Falls. 1697–187–. Mat 6.) 1801 Heriot

These are poor copies of the original plates which were published in 1807 in Heriot's "Travels through the Canadas."

1802

DEMING, A——. Falls of Niagara in Canada. Engraved by Scott for the Gallery of nature and art. 1802. 1802 Deming

This picture, which is taken from Vanderlyn, shows the Horseshoe Fall with the rainbow, the Canadian shore, and a suspicion of the upper rapids.

GOSMAN, ROBERT. Narrative of John Vanderlyn's tour to Niagara in 1802. (Pub. Buff. hist, soc. 15:159–173.) 1802 Gosman

The narrative of that tour was taken down in later years from the artist's dictation, by the late Robert Gosman, son of the pastor of the old Dutch church in Kingston, New York, Vanderlyn's native town.

. . . The cloud of mist from Niagara greeted the pilgrims some eighteen miles from the cataract and its roar was heard two miles. Vanderlyn remained at Niagara twelve days, having

1802
Gosman

reached [there] about mid October. After a day of needed rest at Chippewa the artist took up his comfortable quarters at Burden's farm house hard by the cataract — so near in fact — say 800 yards — that a constant tremor pervaded the house and all its belongings, rendering a new comer rather nervous till custom caused it to be unnoticeable. A fork stuck into the floor would quiver like an aspen.

In 1802 there was no crossing for miles above and below the Falls, and all Vanderlyn's sketches were therefore taken from the Canada shore. The only descent to the water was by "the Indian Ladder," thus perilous enough to deter the timorous from its trial. "Table Rock," which is so noticeable a feature in Vanderlyn's views, was then unmutilated by the wear of the elements, and the gunpowder experiments which have at length destroyed it. Nature had then no divided empire with art, for save an occasional clearing, and a farm house or log cabin here and there, Niagara doubtless appeared very much as it did when Father de Smet, in 16—, stood upon its banks, and the glories and magnificence of the scene were revealed to the first intelligent European to whom they were revealed.

The companion engravings afterwards given as the fruits of this tour by Mr. Vanderlyn were a "General View," and a "View of the Great Fall." The first was taken three fourths of a mile below the cataract near the Indian Ladder, which is directly opposite "the American Fall." From the semi-circular sweep of the shelf, this General View gives a surpassing idea of the magnitude and proportions of Niagara. The sketch for the Great, or Horse Shoe Fall, was taken from Table Rock.

A day or two elapsed before the artist employed his pencil. He said it required that time at least to give him any idea of the proportion of the elements of the scene. The absence of grand scenery, of towering rocks or mountain heights as standards of comparison, rendered it impossible at first to seize an idea of the magnitude of the scene. He said that in truth he was disappointed — a feeling which is confirmed by most who see

Niagara at first, the reality not coming up to the imagination all indulge. Added to this, the tremor of the rocks, and the roar and motion of the mighty waters had a confusing effect, distracting, dizzying and bewildering, for a time. The man overcame the artist. He forgot his errand; sitting several hours as if under a spell, lost to himself, taking in no distinct idea of the scene, and only conscious of an arena of overwhelming grandeur and power in full and turbulent vigor. 1802 Gosman

VANDERLYN, JOHN. A view of the western branch of the Falls of Niagara, taken from the Table Rock, looking up the river, over the rapids. Engraved by F. C. Lewis. 1802. 1802 Vanderlyn

To the Society of Fine Arts of New York this Print is respectfully Inscribed by their most obed't humble Serv't

John Vanderlyn.

This print was from the first painting of Niagara by an American artist. It was painted by Vanderlyn in 1802, and published in London in 1804.

BYE, J——. (sc.) The Falls of Niagara with the adjacent country. 6½ x 14. Lond.: J. Johnson. 1804. (*In* Volney, C. F., View of the climate and soil of the United States. Lond.: for J. Johnson. 1804. Pl. 3. P. 99. *Also* Phila.: Conrad. 1804. P. 80.) 1802 Bye

The Falls are marked straight across the river, and there is also a "Section of the Fall in the middle of the River."

In the French edition "Tableau du climat et du sol des Etats-Unis d'Amerique" . . . published in Paris in 1803 by Courcier, this map is found in volume I, page 112. There are also editions in German and Italian.

CRAIG, W. M. (del.) Falls of Niagara; on the river S^t. Lawrence in Canada. T. Wallis. (sc.) Published as the act directs by C. Brightly and T. Kinnersley, Bungay; Nov. 1804. 1802 Craig

There is a hilly background to this picture and land is visible on the left and in front. The Horseshoe Fall is apparently on the left. Savages are seen on the left in the foreground, and a streamer of mist is shown across the Falls from left to right. The whole picture looks like an improvement on and a transposition of Ellicott.

1802 Vanderlyn

VANDERLYN, JOHN. View of Niagara Falls from the Canadian side. 1804.

Shows both Falls.

1809

1809 Gray

GRAY, HUGH. "Map of Canada, etc." (*In his* Letters from Canada, written during a residence there in the years 1806, 1807, 1808. . . . Lond.: Longman, Hurst, Rees, and Orme. 1809.)

"Falls of the Niagara, 137 feet" are indicated.

1809

Western New York in 1809. (*In* O'Callaghan, E. B., Documentary history of the state of New York. Albany: 1849. Vol. II. P. 690.)

"Falls 150 feet" in height are indicated.

1810

1810 Wilson

WILSON, ALEXANDER. View of the great pitch taken from below *and* General view of the Falls of Niagara, eng. by George Cooke. (Portfolio, March, 1810. 3: No. 3, 182–187.)

These two engravings are from sketches by Wilson to illustrate his poem of "The Foresters" which appeared in this same issue of the Portfolio. The first, the view of the great pitch shows the Horseshoe with the cliff much conventionalized and flattened. The second, the general view of the Falls, is drawn from the Canadian side, and shows the rainbow. The drawing in this is somewhat better although the cliff still appears flattened and the front of Goat Island is apparently a straight wall.

WILSON, ALEXANDER. General view of the Falls of Niagara. (Grosvenor library, Buffalo, N. Y. Views of Niagara Falls. 1697–187–. Mat 7.)

1812

1812 Maverick

MAVERICK, PETER. (sc.) Niagara from below. (Grosvenor library, Buffalo, N. Y. Views of Niagara Falls. 1697–187–. Mat 8.)

This engraving of about the date 1812, is by Peter Maverick (1780–1831), a skilful line engraver who worked principally for book publishers and bank companies.

1813

1813 Eddy

EDDY, I. H. Map of the straights of Niagara from lake Erie to lake Ontario. 15 x 7. N. Y.: Prior & Dunning. 1813. (*In* Smith, D. W., A gazetteer of the province of upper Canada. N. Y.: Prior & Dunning. 1813.)

An inset shows a "vertical section of the great slope which occasions the Falls" On pages 31–33 is a short description of the Falls. **1813** Eddy

Falls of Niagara, in Canada. Engraved by Scott from a drawing. Published by R. Wilks, January, 1813. (Grosvenor library, Buffalo, N. Y. Views of Niagara Falls. 1697–187–. Mat 8.) **1813**

From the "Gallery of Nature and Art." 1813.

MELISH, JOHN. View of the country round the Falls of Niagara. J. Vallance. (sc.) 6½ x 4. (*In* Melish, John, A military and topographical atlas of the United States, including the British possessions and Florida, etc. Phila.: G. Palmer. 1813. Opp. P. 11.) **1813** Melish

A brief description of the Falls and the river is found on page 13.

Grand Niagara, sometimes called *Manchester*, is a small village on the east bank of the Niagara river, immediately above the falls, and nearly opposite to Chippeway. It was laid out for a town a few years ago, and contains a number of dwelling-houses, a grist-mill, a saw-mill, and several mills and machinery are projected. The water is brought out of the river above the rapids, and as the source is inexhaustible and the fall above fifty feet, mills and machinery to a very great extent can be erected here, and this will probably become a very large settlement.

1814

RIDER, ALEX. Geisler, Fr. (sc.) Niagara Wasserfall in seinem gegenwärtigen Zustande, von der Seite von Canada angesehen. Von Alex Rider nach der Natur. (Grosvenor library, Buffalo, N. Y. Views of Niagara Falls. 1697–187–. Mat 8.) **1814** Rider

Published in 1814.

1815

MELISH, JOHN. View of the country round the falls of Niagara. 6½ x 4. (*In his* Travels through the United States. Phila.: G. Palmer. 1815. Vol. II. Opp. p. 318.) **1815** Melish

The Falls are merely indicated.

In the Belfast edition published by Smyth in 1818 on page 506–508 is a view (map) giving a "General view of the Falls of Niagara." The

1815 Melish

view is from the Canadian side and shows the curve of the Horseshoe as very deep, almost a semicircle. This same view is found in the London edition of 1818 published by Cowrie.

1816

1816 Wilkinson

WILKINSON, JAMES. Map of the straights of Niagara from lake Erie to lake Ontario. 7 x 15. (*In his* Diagrams and plans illustrative of the principal battles and military affairs treated of in "Memoirs of my own times." Phila.: Abraham Small. 1816. No. 15.)

This map gives incidentally a map and a vertical section of the Falls. William Darby in his "Tour to Detroit," published two years later than Wilkinson's "Memoirs," considers it "the best delineation of this phenomenon" which he has seen.

1817

1817

(The) Great Falls of Niagara. [Engraving on map of the northern provinces of the United States drawn and engraved for Thompson's New general atlas, 1817.] (*In* Maps, historical and miscellaneous. Fol. 89. Grosvenor library, Buffalo, N. Y.)

The view in this map scrap book is a very pretty little picture showing the American and Horseshoe Falls. Two savages are shown on what is apparently Prospect Point. The American Falls looks like a horseshoe shape, and Goat Island has a fall in front of it. The whole effect is to make the view too narrow.

1817 Hall

HALL, FRANCIS. The Niagara frontier. 7½ x 10. (*In his* Travels in Canada and the United States in 1816–1817. Lond.: Longman, Hurst, Rees, Orme and Browne. 1818.)

Falls 150 feet high are indicated but there is no detail.

1817 Montule

MONTULE, EDOUARD DE. A voyage to North America and the West Indies, in 1817. Lond.: Phillips. 1821. P. 94.

A plate of a small portion of the Canadian Fall. It shows only a thin sheet of water and the space behind the Falls is much emphasized, not to say exaggerated.

1818

1818 James

JAMES, WILLIAM. Map of the straits of Niagara from lake Erie to lake Ontario. 7 x 15. (*In his* A full and correct account of the military occurrences of the late war between Great Britain and the United States. Lond.: For the author. 1818. Vol. I. Frontispiece.)

MILBERT, J.-G. Cascata del Niagara *and* Saut du Niagara. Myon (sc.) (Grosvenor library, Buffalo, N. Y. Views of Niagara Falls, 1697–187–. Mat 8.) **1818** Milbert

MILBERT, J.-G. Chûte du Niagara prise du côté Américain. Deroy Lith. (*In* Milbert, J., Itineraire pittoresque du Fleuve Hudson et des parties laterales l'Amerique du Nord d'après les dessins originaux pris sur les lieux. Paris: chez Henry Gaugain et Cie. Editeurs. No. 36.)

MILBERT, J.-G. Chûte général du Niagara, côté du Canada. Adam et Jacottet Lith. (*In* Milbert, J., Itineraire pittoresque du Fleuve Hudson et des parties laterales l'Amerique du Nord d'après les dessins originaux pris sur les lieux. Paris: chez Henry Gaugain et Cie. Editeurs. No. 35.)

MILBERT, J.-G. Fer a cheval de la chûte du Niagara cote de Canada. Sebatier, Lith. (*In* Milbert, J., Itineraire pittoresque du Fleuve Hudson et des parties laterales l'Amerique du Nord d'apres les dessins originaux pris sur les lieux. Paris: chez Henry Gaugain et Cie. Editeurs. No. 34.)

These drawings of Milbert's, now almost a hundred years old, were from sketches made on his visit to the Falls in 1818, and published as part of a folio volume which accompanied his "Itineraire pittoresque." The folio drawings are printed in tint, are well drawn and have a delicacy of color which makes them both pleasing and attractive. The titles of the subjects are given in French, English, German, and Latin.

1819

DARBY, WILLIAM. The straits of Niagara. 6½ x 13. (*In his* A tour from the city of New York to Detroit in the Michigan territory. N. Y.: For the author. 1819. Opp. p. 155.) **1819** Darby

1820

(The) Falls of Niagara. 1820. (Grosvenor library, Buffalo, N. Y. Views of Niagara Falls. 1697–187–. Mat 26.) **1820**

Both falls are pictured from the Canadian side from a point about opposite the American Fall.

Part of the Fall of Niagara, on the side of Canada. (Grosvenor library, Buffalo, N. Y. Views of Niagara Falls. 1697–187–. Mat 8.) **1820**

Taken no doubt from a volume of the "New voyages and travels" edited by Sir Richard Phillips, between 1820 and 1823.

1820 Wentworth — WENTWORTH, T. H. View in 1820. "XXI." Engraved for Ingraham's "Description of Niagara."

1822

1822 Melish — MELISH, JOHN. View of the country round the Falls of Niagara. 6½ x 4. (*In his* Geographical description of the United States with the contiguous countries including Mexico and the West Indies. New ed. Phila.: By the author. 1822. P. 188.)

1823

1823 Prior — PRIOR, SAMUEL. Nagara Falls woodcut. (*In his* The universal traveller. . . . Lond.: 1823. Pp. 579–582.)

The account of Niagara Falls is embellished by a woodcut which places the "Canadian Fall on the American side of Goat Island."

1824

1824 Darby — DARBY ——. The straits of Niagara, from a map by Mr. Darby. 6½ x 1½. (*In* Blane, W. N., Travels through the United States and Canada. Lond.: Baldwin & Co. 1828. Opp. p. 404.)

1825

1825 Vanderburch — VANDERBURCH, ——. (del.) Voute sons la Chute du Niagara. Boreda por debajo de la Catarata del Niagara. (Grosvenor library, Buffalo, N. Y. Views of Niagara Falls. 1697–187–. Mat 8.)

1827

1827 De Roos — DE ROOS, F. F. (delt.) American Falls of Niagara. (Grosvenor library, Buffalo, N. Y. Views of Niagara Falls. 1697–187–. Mat 10.)

DE ROOS, F. F. (delt.) The crescent seen from below the circular ladder. Printed by C. Hullmandel. (1827.) (Grosvenor library, Buffalo, N. Y. Views of Niagara Falls. 1697–187–. Mat 10.)

DE ROOS, F. F. (delt.) River Niagara. Cloud of the Falls. (Grosvenor library, Buffalo, N. Y. Views of Niagara Falls. 1697–187–. Mat 10.)

These drawings are delicate, and have fully caught the spirit of the Falls. The one of the cloud of the Falls is taken from a point about fifteen miles distant.

HALL, *Captain* BASIL. I. Niagara from below. II. Niagara from above. III. Niagara on the American side. IV. Bridge across the rapids at Niagara. V. A general view of the Falls of Niagara. VI. The river Niagara flowing into Lake Ontario. (Grosvenor library, Buffalo, N. Y. Views of Niagara Falls. 1697–187–. Mat 11.) 1827 Hall

HALL, *Captain* BASIL. Forty etchings, from sketches made with the camera lucida, in North America, in 1827 and 1828. 4th ed. Edinburgh and Lond.: 1830. No. I-VI.)

I. Niagara from below. (Horseshoe Fall.)
II. Niagara from above. (Horseshoe Fall.)
III. Niagara on the American side. (From Goat Island.)
IV. A general view of the Falls of Niagara.
V. Bridge across the rapids at Niagara.
VI. The River Niagara flowing into Lake Ontario.

These views were made in 1827–28 with the camera lucida. The one showing the river flowing into Lake Ontario was taken from the top of General Brock's monument.

1828

Falls of Niagara. (Grosvenor library, Buffalo, N. Y. Views of Niagara Falls. 1697–187–. Mat 16.) 1828

The steel engraving by H. Adlard, London, published by J. Duncan, 1828.

1829

WARREN, H——. Falls of Niagara. Inset to map of west Canada; engraved by Robert Wallis. (*In* Martin, R. M., The British colonies. Lond. and N. Y.: J. F. Tallis. [1829.] Div. 1.) 1829 Warren

1830

BLOUET, A——. (del.) General view of the Falls taken from the Canada shore. (Print.) 1830 Blouet

These Niagara drawings of Blouet form the basis of a series of lithographs published in Paris in the thirties.

BLOUET, A——. (del.) View of the central Fall taken from Goat Island. (Print.)

BLOUET, A——. (del.) View of the great Horseshoe Fall taken from Goat Island. (Print.)

1830 Blouet

BLOUET, A——. (del.) View of the passage under the great Horseshoe Fall taken from the shore on the Canada side. (Print.)

Shows the under side of Table Rock and the entrance to the passage.

BLOUET, A——. (del.) Vue de la chute de Schlosser prise de la rive l'etat de New York. (Print.)

This view of the Schlosser Fall taken from the New York shore shows the shack on Prospect Point and the upper end of the stairs to the foot of the Falls.

1830 Vivian

VIVIAN, W——. American Fall from a ravine opposite. Engraved on stone by T. M. Baynes. Published by C. Hullmandel. 183–.

This print gives the view from between the Falls to high hills in the foreground.

VIVIAN, W——. British or Horseshoe Fall. Engraved on stone by T. M. Baynes. Printed by C. Hullmandel. 183–.

VIVIAN, W——. Horseshoe Fall from the Canada bank. Engraved on stone by T. M. Baynes. Printed by C. Hullmandel. 183–.

VIVIAN, W——. Niagara. Engraved on stone by T. M. Baynes. Printed by C. Hullmandel. 183–.

Print of the American Fall from the bank above.

VIVIAN, W——. Side of the American Fall and Horseshoe Fall in the distance. Engraved on stone by T. M. Baynes. Printed by C. Hullmandel. 183–.

This print gives the view of the Falls from below, and shows the sides as almost smooth rocky walls.

1831

1831 Bennett

BENNETT, W. J. Niagara Falls. View of the American Fall, taken from Goat Island. Published by H. I. Megarey. (1831?)

BENNETT, W. J. Niagara Falls. Part of the American Fall, taken from the foot of the stair-case. Published by H. I. Megarey, N. Y. (1831?)

BENNETT, W. J. Niagara Falls. View of the British Fall, taken from Goat Island. Published by H. I. Megarey, N. Y. (1831?)

BENNETT, W. J. Niagara Falls. Part of the British Fall taken from under the Table Rock. Engraved by J. Hill. Published by H. I. Megarey. N. Y. (1831?)

COLE, THOMAS. A distant view of the Falls of Niagara. From an original picture in the possession of Joshua Bates, Esq. Painted by T. Cole, Esq. Engraved and printed by Fenner Sears & Co. 4½ x 5½. Lond.: I. T. Hinton and Simpkin and Marshall, 1831. (*In* Hinton, J. H. ed., History and topography of the United States. 3d ed. Lond.: J. Dowding. 1842. Vol. II. Opp. p. 484.) 1831 Cole

Cole made many drawings of Niagara on his first visit there in 1829, but the exact date when he painted his great picture is not definitely known. In its day the picture was acclaimed a masterpiece, and has a special interest for us today, as a view of the virgin Niagara surrounded by forests. The same view is found in "Our Globe" listed below, and Malte-Brune's "System of universal geography."

COLE, THOMAS. A distant view of the Falls of Niagara. From an original picture in the possession of Joshua Bates, Esq. Painted by T. Cole, Esq. London: Published April 1, 1831, by I. T. Hinton and Simpkin and Marshall. (Grosvenor library, Buffalo, N. Y. Views of Niagara Falls. 1697–187–. Mat 9.)

Taken from Hinton's "History and topography of the United States."

COLE, THOMAS. A distant view of the Falls of Niagara. Painted by T. Cole. Engraved on steel by T. S. Woodcock. 5½ x 7¾. Bost.: S. Walker, 1832. (*In* Malte-Brune, Conrad, A system of universal geography. Bost.: S. Walker, 1834. Vol. II. P. 199.)

The book in which this engraving is found is a translation of the author's "Precis de la geographie universelle," Paris, 1810–1839. Another edition was published in Philadelphia by Finlay in 1837. Both editions contain a description of the Falls.

COLE, THOMAS. A distant view of the Falls of Niagara, painted by T. Cole, Esq. Engraved on steel by T. S. Woodcock. Boston: Published by S. Walker, 1832. (Grosvenor library, Buffalo, N. Y. Views of Niagara Falls. 1697–187–. Mat 9.)

From Malte-Brune's "System of universal geography," 1834.

COLE, THOMAS. The Falls of Niagara. (Twenty years ago.) 3¾ x 6. (*In* Our globe; a universal picturesque album, ed. by the North American bibliographic institution. Phila.: 1840. Vol. I. P. 9.)

The Falls of Niagara. (Twenty years ago.) (Grosvenor library, Buffalo, N. Y. Views of Niagara Falls. 1697–187–. Mat 9.) 1831

Taken from "Our globe," Philadelphia, 1840.

1831 Noble

NOBLE, LOUIS L. The course of empire, Voyage of life, and other pictures of Thomas Cole, N. A.: with selections from his letters and miscellaneous writings; illustrative of his life, character and genius. N. Y.: Cornish, Lamport, and Co. 1853. Pp. 104–106. 375–377.

An account of Cole's disappointment at his first view of Niagara, and his feeling that even after close acquaintance Niagara was far less than the mountains, that its greatness consisted in its loneliness. Account is given of the various studies that he made. His reflections after his second visit in 1847 are also given.

September 4, 1847.— On Tuesday last, Maria and I returned from an excursion to Niagara. Niagara I have visited before. Its effect on my mind was perhaps as great as when I first saw it. But I am convinced that, sublime and beautiful as it is, it would soon cease to excite much emotion. The truth is, that the mind dwells not long with delight on objects whose main quality is motion, unless that motion is varied. Niagara, stupendous and unceasing as it is, is nevertheless comparatively limited,— limited in its resources and duration. The mind quickly runs to the fountain head of all its waters; the eye marks the process of its sinking to decay. The highest sublime the mind of man comprehendeth not. He stands upon one shore, but sees not the other. Not in action, but in deep *repose*, is the loftiest element of the sublime. With action waste and ultimate exhaustion are associated. In the pure blue sky is the highest sublime. There is the illimitable. When the soul essays to wing its flight into that awful profound, it returns tremblingly to its earthly rest. All is deep, unbroken repose up there — voiceless, motionless, without the colours, lights and shadows, and ever-changing draperies of the lower earth. There we look into the uncurtained, solemn serene — into the eternal, the infinite — toward the throne of the Almighty.

The beauty of Niagara is truly wonderful, and of great variety. Morning and evening, noon and midnight, in storm and calm, summer and winter, it has a splendour all its own. In its green glancing depths there is beauty; and also in its white misty

showers. In its snow-like drifts of foam below, beauty writhes in torment. Iris, at the presence of the sun, at the meek presence of the moon, wreathes its feet with brighter glories than she hangs around the temples of the cloud. Yet all is limited. It cannot bear comparison with that which haunts the upper abysses of the air. There is infinity in the cloud-scenery of a sunset. Men see it, though, so commonly, that it ceases to make an impression upon them. Niagara they see but once or so, and then only for a little while; hence the power it exerts over their minds. Were there Niagaras around us daily, they would not only cease in most cases to be objects of pleasure, but would, very likely, become sources of annoyance. But great, glorious, and sublime Niagara — wonder to the eye of man — I do not wish to disparage thee. Thou hast a power to stir the deep soul. Thy mighty and majestic cadence echoes in my heart, and moves my spirit to many thoughts and feelings. Thy bright misty towers, meeting the vault on high, and based upon the shooting spray beneath, are images of purity. Thy voice — deep calling unto deep, with a might that makes thy hoary cliffs to tremble, leads back the soul to Him, speaking upon Sinai's smoking summit. Thy steep-down craggy precipices are the triumphal gate through which, in grand procession, pass the royal lakes and captive rivers. The soul is full of thee. Favoured is the man who treads thy brink. Thankful should he be to God for the display of one of His most wonderful works. But they are blessed who see thee not, if they will accept the gift which God vouchsafes to all men,— which, in beauty and sublimity, does far surpass Niagara — the sky. O that men would turn from their sordid pursuits, and lift their eyes with reverential wonder there.

1831 Noble

(The) Falls of Niagara. (View.) 3½x4¼. (*In* The lumiere, containing a variety of topographical views in Europe and America. N. Y.: H. R. Piercy & Co. 1831. P. 52. 1831

A view of the Falls from the Canadian side and a description written by some one who had been there in 1797 and again after the Goat Island bridge was built. The writer saw the Falls in summer and winter, and tells of the " myriads of wild ducks " in winter.

1831
Oakley

OAKLEY, G——. Rapids and bridge above the Falls of Niagara. (Grosvenor library, Buffalo, N. Y. Views of Niagara Falls. 1697–187–. Mat 23.)

This painting by Oakley was engraved and printed by Fenner, Seats and Co., London, 1831 and by I. T. Hinton and Simpkin and Marshall.

1832

1832
Burford

BURFORD, ROBERT. Description of a view of the Falls of Niagara, now exhibiting at the Panorama, Leicester square, painted by the proprietor, Robert Burford, from drawings taken by him in the autumn of 1832. Lond.: Brettell. 1833.

The folding sketch which accompanies this pamphlet, contains the main features of Burford's panorama of the Falls, painted from his drawings made at the Falls in 1832. The folding sketch is historically valuable since it indicates the location of buildings now gone.

1832
Vigne

VIGNE, GODFREY T. Six months in America. Lond.: Whittaker, Treacher. 1832. Vol. II. Frontispiece.

The frontispiece of the Falls was drawn by the author.

1833

1833
Cockburn

COCKBURN, *Lieut.-Col.* JAMES PATTERSON, R. A. Chute du Niagara *and* Entrance to the Cave of the Horseshoe, Niagara, on the English side. (Grosvenor library, Buffalo, N. Y. Views of Niagara Falls. 1697–187–. Mat 12.)

Lieut.-Col. Cockburn was a British army officer and a very accomplished artist. His drawings supplied the scenes for the illustrated editions, annuals, etc. These drawings are taken from the "Drawing room scrap-book," London, 1844.

COCKBURN, *Lieut.-Col.* JAMES PATTERSON. Falls of Niagara. Lond.: Ackerman & Co. 1833.

This colored view is from a drawing "from the upper bank, English side," and "is by special permission dedicated to His Most Excellent Majesty, William the Fourth, 1833." It shows the long island off the main shore, since by filling a part of the mainland.

COCKBURN, *Lieut.-Col.* JAMES PATTERSON. The Falls of Niagara. Engraved by C. Hunt. Lond.: Ackerman & Co. 1857.

"This view of Table Rock and Horseshoe Fall, is by special permission dedicated to Her Most Excellent Majesty, Queen Victoria."

HERVIEU, A——. Indians at Niagara. (*In* Power, Tyrone, Impressions of America, during the years 1833, 1834, 1835. Lond.: Richard Bentley. 1836. Vol. I. Pp. 391–411.) **1833** Hervieu

In these etchings of "Indians at Niagara," the Falls are used as a background.

PENDLETON, ——. Niagara; Niagara Falls. (Grosvenor library, Buffalo, N. Y. Views of Niagara Falls. 1697–187–. Mat 12.) **1833** Pendleton

Lithograph of Pendleton's taken from the "Traveller's guide" published by G. M. Davidson, N. Y., 1833.

ARCHER, J——. Niagara Falls. As seen from below. Painted by Wall. 6 x 9½. (*In* Hinton, J. H., History and topography of the United States. New ed. Boston: Samuel Walker. 1834. Vol. I. Opp. p. 348.) **1833** Archer

Fine for masses of water on the American Fall, which looks disproportionately broad because of the great distance of the Horseshoe.

WALL, ——. Niagara Falls as seen from below. (Grosvenor library, Buffalo, N. Y. Views of Niagara Falls. 1697–187–. Mat 12.) **1833** Wall

This view "painted by Wall, engraved by Archer," is taken from Hinton's "History and topography of the United States," Boston, 1834. Vol. II. P. 348. Although not painted as a winter scene the Falls have a frozen look.

1835

BRADFORD, THOMAS GAMALIEL. Niagara Falls and vicinity. 2 x 2¼. (*In his* Comprehensive atlas, geographical, historical and commercial. Bost.: Am. Stationers Co. 1835. P. 56.) **1835** Bradford

Too small to be satisfactory.

1837

CALLINGTON, W. R. Birdseye view of the River Niagara from Lake Erie to Lake Ontario; showing the situation and extent of Navy Island and the towns and villages on the banks of the river in Canada and the United States. . . . from an actual survey made in 1837. Bost. **1837** Callington

———, ———. Niagara Falls. (Chutes du Niagara.) Paris: 1837. **1837**

These plates are from sketches made from nature in March, 1837. The large atlas size contains six plates and text and is very rare.

1838

1838 Miller — MILLER, CROSBY. Niagara Falls, No. 2. View of the Horseshoe Fall from Goat Island. Published by O. G. Steele. Buffalo: 1838.

Gorgeous color in the trees.

1838 Steele & Co. — STEELE & CO. Lithographs of the American Fall from Goat Island and of the Horseshoe Fall from Goat Island. 1838.

Colored. The bridge across the central falls shown.

1838 Tattersall — TATTERSALL, O.——. The destruction of the Caroline steamboat by fire, or the Falls of Niagara, Upper Canada, on the night of Friday, the 29th Dec., 1837. Engraved by J. Harris. Lond.: R. Ackermann. 1838.

The boat in flames is shown at the apex of the Horseshoe.

1838 Wyld — WYLD, JAMES. Sketch of the Niagara river. 11 x 7. Lond.: J. Wyld. 1838.

1840

1840 Bartlett — BARTLETT, W. H. The Horse Shoe Fall, Niagara — with the tower. 7 x 4½. (*In* American scenery. From drawings by W. H. Bartlett. The literary department by N. P. Willis. Lond.: G. Virtue. 1840. Vol. I. P. 32.)

BARTLETT, W. H. The landing on the American side. (Falls of Niagara.) 7 x 4¾. (*In* American scenery. From drawings by W. H. Bartlett. The literary department by N. P. Willis. Lond.: G. Virtue. 1840. Vol. I. P. 97.)

BARTLETT, W. H. Niagara Falls. (From near Clifton house.) Chutes de Niagara vues près de Clifton house.— Der wasserfall Niagara vom Cliftonchen hotel gesehen. 7 x 4½. (*In* American scenery. From drawings by W. H. Bartlett. The literary department by N. P. Willis. Lond.: G. Virtue. 1840. Vol. I. P. 45.)

BARTLETT, W. H. Niagara Falls from the ferry. 7 x 4½. (*In* American scenery. From drawings by W. H. Bartlett. The literary department by N. P. Willis. Lond.: G. Virtue. 1840. Vol. I. P. 4.)

BARTLETT, W. H. Niagara Falls. (From the top of the ladder on the American side.) 7¼ x 4¾. (*In* American scenery. From drawings by W. H. Bartlett. The literary department by N. P. Willis. Lond.: G. Virtue. 1840. Vol. II. P. 12.)

BARTLETT, W. H. The rapids above the Falls of Niagara. 7 x 4½. (*In* American scenery. From drawings by W. H. Bartlett. The literary department by N. P. Willis. Lond.: G. Virtue. 1840. Vol. I. P. 16.) **1840** Bartlett

The Niagara drawings of Bartlett form an important part of his notable art work "American scenery." They are taken from various points of view of the Falls and rapids and are of the greatest value historically. Especially valuable is the view of the ferry landing on the American side, showing the stairs, etc., by which the ascent to the top of the cliff was made. The text describing the drawings is written in a charming literary style.

BARTLETT, W. H. Views of Niagara Falls (Grosvenor library, Buffalo, N. Y. Views of Niagara Falls. 1697–187–. Mat 13 *and* 13a.)

The pictures shown on these two mats are as follows:

13 — The landing on the American side (Falls of Niagara). J. C. Bentley.

The rapids above the Falls of Niagara. (R. Brandard.)

Niagara Falls (From near Clifton House). (J. Cousen.)

The Horse Shoe Fall, Niagara with the Tower. (R. Brandard.)

13a — The Horse-Shoe Falls (from the Canadian side). (J. Cousen.)

View below Table Rock. (J. Cousen.)

The banks of the River Niagara (below the Falls). (R. Brandard.)

The outlet of Niagara River (Lake Ontario in the distance). (H. Adlard.)

The Whirlpool (on the Niagara). (E. Radcliffe.)

LANGHEIM, F——. Daguerreotypes of Niagara. (1840?) **1840** Langheim

1841

DE VEAUX, SAMUEL. Map of Niagara Falls and guide table. 12 x 16. (*In his* The traveller's own book, to Saratoga Springs, Niagara Falls and Canada. . . . Buffalo: Faxon & Read. 1841.) **1841** De Veaux

1843

BODMER, CHARLES. View of Niagara Falls. (*In his* Atlas of eighty-one plates to accompany Wied-Neuwied, M. A. P. von Prinz. **1843** Bodmer

1843 Bodmer — Travels in the interior of North America. Lond.: Ackermann & Co. 1843. Plate No. 39.)

1844

1844 Holley — HOLLEY, ORVILLE LUTHER. Chart of Niagara falls, the shores and islands. 4½ x 2½. (*In his* The picturesque tourists. N. Y.: Disturnell. 1844. Opp. p. 174.)

"View from Prospect Point showing the stairs" — "Niagara Falls from Prospect Point."

A fine chart which shows all the islands around the Falls and the points of interest around Goat Island.

HOLLEY, ORVILLE LUTHER. Map of Niagara strait and parts adjacent. 5 x 3. (*In his* The picturesque tourists. N. Y.: J. Disturnell. 1844. Opp. p. 176.)

1844 — Steele's Niagara Falls portfolio, containing eight new views of Niagara Falls taken from the most striking points. Also a facsimile of a view taken by Father Hennepin, in 1678. Lithographed by Hall and Mooney. Buffalo: Steele's press. 1844.

Some of the views are very good, being based apparently upon Bartlett.

1845

1845 Hamilton — HAMILTON, ———. Niagara Falls, American side. 11 x 24. Eng. by J. M. Butler. Phila. (1845.)

HAMILTON, J——. Niagara Falls. (American side.) (Grosvenor library, Buffalo, N. Y. Views of Niagara Falls. 1697–187–. Mat 19.)

This view, which was painted by J. Hamilton from a sketch by T. Taylor, and engraved at J. M. Butler's establishment in Philadelphia, gives a broad, low view of the Falls, and shows the stairs on the American side.

HAMILTON, ——. Niagara Falls, Canada side. 11 x 22. Eng. by J. M. Butler. Phila.: (1845.)

HAMILTON, J——. Niagara Falls (Canadian side). Grosvenor library, Buffalo, N. Y. Views of Niagara Falls. 1697–187–. Mat 20).

Another painting by Hamilton, from a sketch by T. Taylor and engraved at the establishment of J. M. Butler, Philadelphia. It is another low, broad view of the Falls which shows the Maid of the Mist at the foot of the Falls.

THE AMERICAN FALLS, GOAT ISLAND, AND THE HORSESHOE (CANADIAN) FALLS

Taken some distance below the Falls. The boat "Maid of the Mist" may be seen near the Horseshoe Falls

HAVELL, ROBERT. Niagara Falls. Painted from the Chinese pagoda. Point View Gardens. Sing Sing: 1845. **1845 Havell**

Painted from Prospect Park; shows Iris Island, the ferry house on Prospect Point, the ferry, the Horseshoe Fall and the stairs on the Canadian side. The view is colored from a painting.

FRIEND, WASHINGTON. Views of Niagara Falls. (*In* Falls of Niagara; a complete guide. . . . T. Nelson & Sons. Lond.: Edinburg, N. Y. & Toronto: 1846. **1845 Friend**

This guide contains six colored views of Niagara, among them one of the Horseshoe Falls, the whirlpool near Niagara, and Brock's monument which are credited to Washington Friend.

FRIEND, WASHINGTON. General view of Niagara Falls. View of the Canadian Fall. 1846.

These two large paintings of the Falls are in the possession of the Royal Family of Great Britain. The artist, an Englishman, made a number of studies of the Falls, which formed a part of his panorama of American scenery, widely exhibited through England. Some of these Niagara studies may be found reproduced in colors in English guide-books.

HAVELL, ROBERT. Panoramic view of the Falls of Niagara. 1846. **1845 Havell**

Colored view of the Falls by Havell, who was both painter and engraver.

VAUDRICOURT, A——. Views of the cataract. 1845–6. **1845 Vaudricourt**

These views were used by various lithographers.

1848?

1848? Davis

DAVIS, *Major* HENRY. "Great Horseshoe Fall." (1848?)

1849

[BREWER, ——.] A description of the Mammoth Cave of Kentucky, the Niagara River and Falls, Mount Vernon, etc., etc., to illustrate Brewer's panorama. Phila.: U. S. Job Printing office. 1849. Pp. 8–12. **1849 Brewer**

A brief description of all points of interest, historical and scenic, on both sides of the river. Brewer's panorama was shown in American cities in the early fifties.

1849
Johnson

JOHNSON, H. G. A map of Niagara river, four miles above and three miles below the Falls. [1849c.]

Notes, scenic and historical.

1850?

1850?
Groome

GROOME, W.—GRAHAM, A. W. Niagara. (Grosvenor library, Buffalo, N. Y. Views of Niagara Falls. 1697–187–. Mat 16.)

This view of the Horseshoe Falls apparently taken from Goat Island is small, colored, shows the rainbow and two Indians in the foreground.

1851

1851
C. R.

C. R. (del.) Niagara Falls. (Horseshoe Fall.) John Poppel (sc.) Published for Herman J. Meyer. N. Y.: 1851.

Fine view, showing the Tower and the Maid of the Mist in the river below.

C. R. (del.) John Poppel (sc.). Niagara Falls. (Horseshoe Fall.) (Grosvenor library, Buffalo, N. Y. Views of Niagara Falls. 1697–187–. Mat 16.)

1851
Prescott

PRESCOTT, WILLIAM H. Letter to the Earl of Carlisle regarding a Niagara picture by Lebron, under date of January 27, 1851. (Pub. Buf. hist. soc. 15:141–143.)

Boston, U. S., January 27, 1851.

MY DEAR CARLISLE: I wrote you from the country that, when I returned to town, I should lose no time in endeavoring to look up a good painting of the Falls of Niagara. I have not neglected this; but though I found it easy enough to get paintings of the grand cataract, I have not till lately been able to meet with what I wanted. I will tell you how this came about. When Bulwer, your Minister, was here, I asked him, as he has a good taste in the arts, to see if he could meet with any good picture of Niagara while he was in New York. Some time after, he wrote me that he had met with " a very beautiful picture of the Falls, by a Frenchman." It so happened, that I had seen this same picture much commended in the New York papers, and I found that the artist's name was Lebron, a person of whom I happened to know

something, as a letter from the Viscount Santarem, in Paris, com- 1851
mended him to me as a " very distinguished artist," but the note Prescott
arriving last summer, while I was absent, I had never seen Mr. Lebron. I requested my friend, Mr. ———, of New York, on whose judgment I place more reliance than on that of any other connoisseur whom I know, and who has himself a very pretty collection of pictures, to write me his opinion of the work. He fully confirmed Bulwer's report; and I accordingly bought the picture, which is now in my own house.

It is about five feet by three and a half, and exhibits, which is the most difficult thing, an entire view of the Falls, both on the Canada and American side. The great difficulty to overcome is the milky shallowness of the waters, where the foam diminishes so much the apparent height of the cataract. I think you will agree that the artist has managed this very well. In the distance a black thunderstorm is bursting over Goat Island and the American Falls. A steamboat, the " Maid of the Mist," which has been plying for some years in the river below, forms an object by which the eye can measure, in some degree, the stupendous proportions of the cataract. On the edge of the Horseshoe Fall is the fragment of a ferry-boat which, more than a year since, was washed down to the brink of the precipice, and has been there detained until within a week, when, I see by the papers, it has been carried over into the abyss. I mention these little incidents that you may understand them, being somewhat different from what you saw when you were at Niagara; and perhaps you may recognize some change in the form of the Table Rock itself, some tons of which, carrying away a carriage and horses standing on it at the time, slipped into the gulf a year or more since.

I shall send the painting out by the " Canada," February 12th, being the first steamer which leaves this port for Liverpool, and as I have been rather unlucky in some of my consignments, I think it will be as safe to address the box at once to you, and it will await your order at Liverpool, where it will probably arrive the latter part of February.

1851
Prescott

I shall be much disappointed if it does not please you well enough to hang upon your walls as a faithful representation of the great cataract; and I trust you will gratify me by accepting it as a souvenir of your friend across the water. I assure you it pleases me much to think there is anything I can send you from this quarter of the world which will give you pleasure. . . .

And believe me, dearest Carlisle,

Ever faithfully yours,

W. H. PRESCOTT.

1851

———— ————. Panoramic view of Niagara. c 1852.

This colored view is taken from the Canadian side, and shows the edge of the Canadian shore in the foreground.

1851
Dana

DANA, CHARLES A. Niagara Falls (general view from Clifton house). 4 x 6. (*In* Dana, C. A. ed., The United States illustrated. 2 vol. in one. N. Y.: H. J. Meyer. [1853.] Vol. I. P. 13.)

A pretty view looking full into both falls from below and showing the rainbow. There is also a description, pages 13–18.

1853

1853
Frankenstein

(FRANKENSTEIN, G. N.) Niagara. (Harp., Aug., 1853. 7:289–305.)

The Falls described in the form of running commentary on sketches by G. N. Frankenstein, made as studies for his "Panorama of Niagara Falls." "The artist from whose labors we have so largely borrowed, has made the study of the Great Cataract a labor of love. He summered and wintered by it. He has painted it by night and by day; by sunlight and by moonlight; under a summer sun, and amid the rigors of a Canadian winter, when the gray rocks wore an icy robe, and the spray congealed into icicles upon his stiffened garments. The sketches from which we have selected have grown up under his hands for a half score of years; and we can not doubt that many to whom Niagara wears the face of a familiar friend will find themselves transported to it in imagination, as they look upon the results of his labors; and many who may never behold the Falls, will gain some just though inadequate conception of their magnificence and beauty."

FRANKENSTEIN, G. N. Niagara Falls. (Jones sc.) E. Ferrett & Co. Phila.: (1853). **1853** Frankenstein

A general view of the Falls taken from Hennepin's point.

GEIL, SAMUEL. Map of the vicinity of Niagara Falls. Phila.: James D. Scott. N. d. **1853** Geil

GEIL, SAMUEL *and* DELP, J. L. Map of the vicinity of Niagara Falls. From actual surveys by Samuel Geil. Colored. 22 x 28. Phila.: [1853.] **1853** Geil & Delp

GUERNSEY, ALFRED H. Niagara. (Harp., Aug., 1853. 7:289–305.) **1853** Guernsey

Noteworthy because of its illustrations which were selected from over a hundred views painted by G. N. Frankenstein as studies for his Panorama of Niagara Falls.

I. Niagara Falls from the Ferry. II. Aus Fluss des Niagara. III. Outlet of the Niagara. IV. Below Table Rock (Niagara). V. Niagara Falls (central view from Clifton House). (Grosvenor library, Buffalo, N. Y. Views of Niagara Falls. 1697–187–. Mat 14.) **1853**

These views, which resemble Bartlett, are taken from the "United States illustrated" edited by C. A. Dana, and published by H. J. Meyer, N. Y. (1855.)

1854

BUTTRE, J. C. Niagara Falls. (Lit. liv. age, May 27, 1854. 41:385.) **1854** Buttre

A very fine view of the Falls from under Table Rock, "engraved from an original sketch." Somewhat suggests Bartlett's treatment of the same subject.

JUDAH, T. D. (Civil engineer.) Map of the villages of Bellvue, Niagara Falls and Elgin. 30 x 42. Buffalo, N. Y. Lith. of Compton and Gibson. [1854.] **1859** Judah

The details show a "section of strata along the Niagara River from Lake Ontario to Lake Erie," and a "section of the Falls abreast."

——— ———. Niagara Falls. (General view from Clifton House. Pub. for H. J. Meyer. N. Y. [1854.]) **1859**

——— ———. Rapids of the Niagara above the Falls for the proprietor H. J. Meyer. Pub. for Paul Bernard. N. Y.: [1854.] **1859**

1854
Witmer

WITMER, TOBIAS. Map of the town of Niagara. Drawn from surveys and authentic records by Tobias Witmer, surveyor, 1854. 24 x 50. Buffalo, N. Y.: Lith. by W. Berggoetz. [1854.]

An inset gives a general view of the Falls from the landing on the Canadian side, about where the steamer docks now.

1855

1855
Bornet

BORNET, JOHN. Niagara Falls, American side. Published by Goupil & Co., 772 Broadway, N. Y.: 1855.

This is an imposing colored view showing a steamer and a rowboat in the lower river.

1855
Ferguson

FERGUSON, WILLIAM. America by river and rail, or Notes by the way of the new world and its people. Lond.: James Nisbet. 1856. Pp. 441–458.

This is one of the first descriptions from a distance. The frontispiece shows the Horseshoe Falls from the Canadian side.

1857

1857
Church

CHURCH, FREDERICK EDWARD. Niagara. 1857.

This painting of Niagara, hailed in 1857 as the most wonderful representation of the great waterfall, still stands in the front rank. Ten years after it was painted the picture won a prize at the Paris Exposition. After being widely exhibited in Europe, it was returned to this country and is now in the Corcoran Art Gallery in Washington. In the National Gallery of Scotland at Edinburgh, there is another Niagara by Church.

CHURCH, FREDERICK EDWARD. The great fall, Niagara. Painted by Frederick Edward Church. N. Y. Williams, Stevens, Williams & Co. 1857.

A pamphlet of fourteen pages giving press opinions of the great painting. The pamphlet is prefaced by Brainard's "Niagara."

From the New York Daily Times.

Church's Niagara. . . . What proposition has been more universally accepted as an axiom in American landscape art than this — that Niagara could not be reproduced on the canvas? Everybody has echoed the remark — everybody has believed it — nobody could question, because nobody had disproved it.

And now there comes a quiet artist quietly forward, who calmly puts his work down before gazing Broadway, and begs leave to differ from the critics and the public — and in the twinkling of an eye wins all the world over to his side! People go and look at Mr. Church's Niagara and come away only wondering that anybody who tried to do it every failed to paint the Cataract. It seems the simplest thing in the world, for it has been done simply — with the simplicity of power, and the wonderful, convincing truth of simplicity. 1857 Church

You pass from the bustle of the street into the small back room of the Messrs. Williams and Stevens, . . . and behold! there is the marvel of the Western World before you. The broadening river sweeps curving to the plunge — the beryl green of the central watery masses charms their else awful night into delicious beauty — the vaporous white veils of mingling spray and mist float lightly and tenderly up, smitten through and through with the glory of the diffusive daylight and the splendor of the glittering rainbow — far away, far as the eye can follow the dreaming fancy, the distant landscape glows and mellows through every hue of purple, gold and amethyst — and overhead the sky bends, warm and light, and soft — a heaven worthy of the scene.

To write of this picture is like writing of the Falls themselves. You think of it, and your pen hangs idly in your hand, as your imagination brings back to you the grandeur and the grace you gazed upon. The painting of such a picture marks an era in the art of our country. . . .

From the Courier and Enquirer.

Fine Arts. . . . It is a view of Niagara Falls which will cause all others ever painted to be forgotten. We know of no American landscape which unites as this does the merits of composition and treatment; for in painting such a picture the choice of a point of view may justly be called composition. We have yet to see the modern landscape of any school which surpasses in its faithful presentation of the characteristic facts of nature. The

1857
Church

picture has no foreground, to speak literally. It is water to the base line, and water everywhere. The only land that appears is in two strips of shore in the far distance; which, by the way, are most delicately and truthfully painted. The view is from a point on the Canada side, a little above the Fall, the whole curve of which, except of course the small segment next to the spectator, is taken in at once by the eye. The point of view being elevated, the Fall opposite to the spectator is seen at its full height, and just above it the river stretches away into miles of broken surface. A few light diffusive clouds in the sky; and just above the horizon peep one or two peaks of heavy *cumuli*. The rainbow glows with luminous color, as if it were cast by a prism. Its grand character is given to the picture by the skilful presentation of the great mass of water; and the marvel of its treatment is the expression of mobility which every part of it conveys. There is not a line's breadth upon it that does not seem in motion; not an outline in it that does not appear to be just passing into some other form. One of its marvellous passages is the view up the river, where the distance of miles is clearly expressed in a space of half a hand's breadth."

From the New York Daily News.

Church's Painting of Niagara Falls — . . . Mr. Church has shown himself the great artist in the judicious selection of his point of view, and the scope embraced in his picture. The Horse-Shoe Fall, viewed from the Canada shore a few rods above Table Rock, is taken in at one sweep of the vision from the shore to the island; while the tower, the rocks below, and the rapids receding into the distance contribute to make this view the most eminently characteristic.

Building up his composition upon the true principles of the sublime, he has not marred the simple grandeur of his subject by the introduction of any extraneous forms or objects of animal life. He has even excluded the shore from his "foreground," and makes the moving mass of waters — as they go rushing madly at

his feet over angry looking rocks here and there revealed amid the snowy-crested breakers — serve him for his only, and the most appropriate, foreground. 1857 Church

In some respects it is as difficult to describe this picture as the subject of it. Where *sound* and *motion* overwhelm the spectator, as in beholding Niagara, earth and sky are forgotten. So in this painting, we have no earth for a foreground, and a sky that is so fleecy and palpitating for a distance, that until a section of a rainbow (which seems to counterfeit nature) paints itself upon the rising spray, and the deep emerald of the falling waters carries your eye upward, you have been scarcaly conscious that the picture had any sky at all: but you now feel that it has, and the most admirable which could have been given it; for who ever thinks of the sky when viewing Niagara?

There is the warm glow of an October afternoon reflected back from the zenith upon the waters: and with this delicate amber tint, flickering between sunlight and shade — foam crested waves and their deep green caverns, this picture presents the most truthful representation of water, in all the phases of color and motion, that we have yet seen upon the canvas. Your eye and mind wander up the " Rapids " until lost in contemplation; and you only return with the rush of waters, to leap madly into the chasm below, to be lost again in the most sublime reverie!

The picture makes you feel this; and, if you have imagination, much more. It is the great painting of the grandest subject of nature! It is the *chef d'oeuvre* of Niagaras upon any canvas, and must give to its painter a fame as imperishable as his subject.

From the Boston Weekly Traveller.

Church's Painting of Niagara — . . . This Niagara of Church's is so calm and satisfactory that ordinary praise is impertinent. To say, " How beautiful it is! " is like saying the same thing of a perfect June day. A thousand pictures have been painted of the same great scene; everybody has been to gaze upon

1857
Church

it, and to listen to it, and remember it forever. But when you see this, you feel at once, this is Niagara; the eye that could command the hand has seen it at last, and the future pictures of the Cataract may be different — they cannot be superior to this.

The view selected is the simplest and most comprehensive. The spectator stands a little above Table Rock, and the eye looks along the level of the rapids, seeing them toss and curl against the sky and horizon, and the spectator understands why it is called an ocean pouring itself away. The foreground is the swift, shattered water of the shallow shore — rapids gliding to the brink of the Fall which forms the Canada side of the Horse-Shoe, and the middle of the canvas is filled with the plunge of the main sheet into the abyss. It is all water, except a shore of Goat Island upon the left, and the long, low, woody Canada shore upon the right. Over all shines a transparent summer sky, with a dull, distant thunder mist beyond Goat Island, and soft, peaceful clouds over Canada. A rainbow springs from the abyss; but it is only fragmentary, for the vapor is wafted aside and broken. This rainbow is the purest light I ever saw in painting. Turner, whose later life was a long effort to produce light, and a marvellous success in doing it, has nothing which seems to me so wonderful as this broken rainbow of Church's. It is hard to believe that it is not a reflection thrown upon the canvas from a prism.

Will you not be surprised to hear, too, that if the young American has rivaled Turner's light, he has also equaled the pre-Raphaelite detail? Not *as* the pre-Raphaelites, but with a conscientious finish of minuteness, which does not in the least clash with the broad beauty of the whole. The stones in the little round tower upon the American side of the Great Fall are perfectly made out, if you will look to see; and far away upon the northern shore of the rapids, the details of a country yard are visible.

But the calmness and simplicity of the picture are its charms. Everybody remembers how tranquil his remembrance of the scene is, and how simple its grandeur is. Niagara makes no appeal to

your admiration; and art is true to its sympathy with nature, when, as I said, it almost scorns your approval. A rose is beautiful for its own beauty, not for our praise; and this picture makes no points, has no rhetoric, and takes no postures; but challenges your homage as Sabrina fair challenges it, under the glassy wave, or as the water's own transparency compels it. 1857 Church

[Church's Niagara.] (Lit. liv. age, Oct. 24, 1857. 55:254–255. 1857

. . . But Mr. Church has painted the stupendous cataract with a quiet courage and a patient elaboration, *which leaves us, for the first time, satisfied that even this awful reality is not beyond the range of human imitation.*

Mr. Church's picture is an oblong of some seven or eight feet by three and a half, if our eyes have not deceived us. The view is taken from the Canadian side, a little above Table Rock, and it includes the whole sweep of the Horseshoe Fall, to the corner of Goat Island. There is no foreground or shore. The spectator looks right along the Canadian rapids, as their swirls converge for the tremendous leap. A shattered tree trunk is caught in the opposing eddies, which churn and chafe into foam over the layers of brown rock, the sunlight striking their edges into transparent green where they fling themselves over the lips of the ledges, in their hurrying course to the plunge of the mighty river. About the center of the picture the bend of the barrier enables us to watch the downward leap of the river, not in a sheet, but in innumerable cascades from every projecting point, shivered into fine fringes of foam, and losing themselves in the spray to which the mass of water is churned by its fall. Across the wet air of this spray cloud the rainbow flings its prismatic arch. Beyond we see the distant lines of foam that mark the rapids, and further still the terraces of the Chippeway shore flushed with the rich hues of American Autumnal forest. The time is towards evening. . . . It bears throughout unmistakable evidence of the most close and successful study. To paint running water is always difficult. But when the running water is the expanse of a mighty river, broken into countless eddies by rock ledges, and hurrying to such a fall,

1857 Church

it may well be conceived, what labor has been necessary to apprehend the bewildering facts, what patient mastery to represent them, so as to leave the spectator impressed, as by the presence of the stupendous reality, with the abstraction of motion and sound. . . .

1857 Fairbanks

FAIRBANKS, J. H. A map of the vicinity of Niagara Falls. Drawn from actual survey for Tunis' guide. 16 x 21. Buffalo, N. Y.: E. R. Jewett & Co. 1857.

Shows Gull Island, and various points on the American and Canadian shores are indicated — the Pavilion, Prospect House, etc. There are two small views of the Falls.

1859

1859

Gignoux's Niagara. (Harp. w., July 9, 1859. 3:436.)

An engaving of " Gignoux's Niagara — The Property of August Belmont."

We have the pleasure of laying before our readers an engraving of M. Gignoux's Niagara, one of the noblest works of American art. It will be remembered that M. Gignoux executed, some eighteen months ago, a painting of Niagara, which was exhibited together with a painting on the same subject by Mr. Church. Both became the property of a firm of print-sellers. Mr. August Belmont, the well-known banker and millionaire, who expected to purchase M. Gignoux's picture, was so much disappointed at losing it that he gave the artist a commission to execute a new Niagara for him. The result of that order is the admirable work which we now engrave. . . . M. Gignoux has painted Niagara by moonlight, the point of view being from Goat Island, and the main scene the Horseshoe Fall. Words fail to describe the beauty of the original work. It is one of those delicious scenes on which the eye can feast for hours together. One almost fancies, in gazing into the soft summer night-air which envelops the scene, that the ear hears the roar of the cataract as the eye sees the floating moonbeams which dance over the broad rushing stream.

Beside the Falls the picture shows a bit of Goat Island and the Hennepin Tower in the foreground, the bend of the Horseshoe and the dim distant Canadian shore. 1859

RICHARDT, FERDINAND. The great international railway bridge. Engraved by D. E. Glover. 1859. 1859 Richardt

The Falls are visible in the background.

RICHARDT, FERDINAND. Niagara Falls. (From the American shore.) A. H. Payne (sc.). (1859.)

This print shows Prospect Park and the old railings of wood.

RICHARDT, FERDINAND. The Tower. A. H. Payne (sc.). (1859.)

HESS, B——. The Falls of Niagara, from the Canada side. 1859. 1859 Hess

This beautiful colored view shows the angle of the Horseshoe, the tower, Goat Island and part of the American Fall, with the rainbow by the Horseshoe.

———— ————. View of Niagara Falls. (*In* Engleheart, Gardner, D., Journal of the progress of H. R. H. the Prince of Wales through British North America; and his visit to the United States, 10th July to 15th November, 1860. Privately printed. 1860. Pp. 63–66.) 1859

This brief journal of three days spent at the Falls and in their vicinity is embellished by a handsome view of the Falls from Goat Island showing the tower, and the angle of the Horseshoe.

1860

BIERSTADT, E—— American Falls from Goat Island. (Grosvenor library, Buffalo, N. Y. Views of Niagara Falls. 1697–187–. Mat 18.) 1860 Bierstadt

An artotype.

BIRCH, T. Falls of Niagara from the American ladder. 1860? (Grosvenor library, Buffalo, N. Y. Views of Niagara Falls. 1697–187–. Mat 16.) 1860 Birch

This drawing by Birch was engraved by J. D. Steel.

Birdseye view of Niagara Falls and surrounding country. 1860? (Grosvenor library, Buffalo, N. Y. Views of Niagara Falls. 1697–187–. Mat 18.)

1860 Cataract house, Niagara Falls. [1860?] (Grosvenor library, Buffalo, N. Y. Views of Niagara Falls. 1697–187–. Mat 17.)

A letterhead.

Cataract house, Niagara Falls. [1860?] (Grosvenor library, Buffalo, N. Y. Views of Niagara Falls. 1697–187–. Mat 17.)

Clifton house, Niagara Falls. [1860?] (Grosvenor library, Buffalo, N. Y. Views of Niagara Falls. 1697–187–. Mat 17.)

Fall of Niagara, Canada. [1860?] Grosvenor library, Buffalo, N. Y. Views of Niagara Falls. 1697–187–. Mat 16.)

Taken from the Canadian side, some distance down stream from the Falls.

1860
Hall and Mooney

HALL *and* MOONEY. Niagara Falls from near the head of the ferry stairs. (1860?) Grosvenor library, Buffalo, N. Y. Views of Niagara Falls. 1697–187–. Mat 17.)

HALL *and* MOONEY. View from the pagoda. (1860?) (Grosvenor library, Buffalo, N. Y. 1697–187–. Mat 17.)

Both the above are lithographs.

1860
Holloway

HOLLOWAY, F——. American Fall from the ferry *and* the Horseshoe Fall from Table Rock. 1860. (Grosvenor library, Buffalo, N. Y. Views of Niagara Falls. 1697–1870. Mat 15.)

These two views were drawn by F. Holloway about 1860.

1860
J. V. C.

J. V. C. (del.) View of Niagara River and Lake Ontario from the top of the mountain at Lewiston. Jewett, Thomas & Co., printers. [1860?] (Grosvenor library, Buffalo, N. Y. Views of Niagara Falls. 1697–187–. Mat 16.)

Stereotyped view.

1860
Krausse and Eltiner

KRAUSSE —— *and* ELTINER —— (sc). Eisenbahn Hangerbrucker uber den Niagara. [1860?] (Grosvenor library, Buffalo, N. Y. Views of Niagara Falls. 1697–187–. Mat 17.)

1860 (Niagara frontispiece) *and* Niagara Falls from the American shore. (Grosvenor library, Buffalo, N. Y. Views of Niagara Falls. 1697–187–. Mat 15.)

The first of these two pictures looks like a Washington Friend production. Both of them are taken from the "Historical and statistical

gazetteer of New York State" by John H. French, published by R. P. Smith, Syracuse. 1860. **1860**

NOEL, J——. (del.) Outhwaite (sc.). Les cataracts du Niagara. [1860?] (Grosvenor library, Buffalo, N. Y. Views of Niagara Falls. 1697–187–. Mat 16.) **1860** Noel

A view of the Horseshoe Fall from Goat Island showing the tower and the Maid of the Mist. Three figures and a dog appear in the foreground on the left and the Canadian shore is seen in the distance.

NOEL, J——. (del.) Outhwaite (sc.). Pont suspender sur le Niagara. [1860?] Grosvenor library, Buffalo, N. Y. Views of Niagara Falls. 1697–187–. Mat 22.)

Printed by Ch. Charden, Paris.

SAINSON, DE——. (del.) Chute du Niagara. (1836.) Grosvenor library, Buffalo, N. Y. Views of Niagara Falls. 1697–187–. Mat 16.) **1860** Sainson

SHRADE, —— (sc.). Chute du Niagara. (1860?) (Grosvenor library, Buffalo, N. Y. Views of Niagara Falls. 1697–187–. Mat 18.) **1860** Shrade

Published by Furne of Paris.

Suspension bridge at Niagara Falls. (1860?) (Grosvenor library, Buffalo, N. Y. Views of Niagara Falls. 1697–187–. Mat 16.) **1860**

This was engraved for the Family Circle and Parlor Annual.

Three views in colors from the "Falls of Niagara" (guide-book) 1860. (Grosvenor library, Buffalo, N. Y. Views of Niagara Falls. 1697–187–. Mat 15.) **1860**

The Table Rock and Terrapin Tower and the Horseshoe Fall from Goat Island taken from photographs, and one of the Horseshoe Fall from a drawing by Washington Friend.

WINCKELMANN, ——, *and* SCHUE, ——. Aussicht auf den Niagara Fall. (1860?) (Grosvenor library, Buffalo, N. Y. Views of Niagara Falls. 1697–187–. Mat 17.) **1860** Winckelmann and Schue

This lithograph, made in Berlin, gives the view from an open window overlooking the Falls.

1864

1864 Dore

DORE, GUSTAVE. Atala album, photographs of twelve illustrations to Chateaubriand's Atala. Phila.: Frederick Leypoldt. N. Y.: F. W. Christem. 1864.

Contains photograph of Dore's splendid view of the Falls with several others showing the gorge and the rapids.

1868

1868 Church

Mr. Church's new picture of Niagara. (Lit. liv. age, May 15, 1868. 97:441–443.)

. . . so he has painted the Falls a second time, and now from the opposite side of the St. Lawrence.

. . . . .

Our readers may remember that Mr. Church's former picture of the Falls of Niagara was an oblong, whereas this is an upright one; the other also was in great part a study of the rapid just before the fall, whilst this is mainly a study of the fall itself and of the basin below it. If asked which of the two pictures we should most care to possess, we should be much embarrassed, for each illustrates and supplements the other. The two together are a splendid proof of what landscape-painting may do in a direction which, though secondary to poetical or creative art, is nevertheless equally important, and far more likely to be of service to the generality of mankind.

. . . . .

The present picture has what is usually considered a disadvantage, in an exceedingly high horizon. It is, in fact, almost a bird's-eye view of the basin under the fall, the spectator being on the level of the rapid above; . . .

The effect is much the same as that of the preceding picture. The sky is of a dull dusty warm gray, with warm white clouds low on the horizon. The woods on the distant Canadian shore are obscured by the mist rising from the fall, which adds immensely to the artistic availableness of the subject. The reader

will remember that the falls are divided by a mass of rock which is crowned by a dense wood; this wood is also obscured by mist, but partially, and much less so than that in the distance; and the effects of mist on these woods are full of interesting study, and surprisingly truthful. Let us now follow the fall from the Canadian shore to the American, from which we see it. First, we have three or four white cascades like a Swiss fall, then a rather broader mass, and then for a space we see no water at all on account of the rising mist. A little to the left of the mist, however, there is a broad sheet of pure emerald, whose translucent beauty, though it really covers only a few square inches of canvas, leads the imagination to give an ideal splendour to the whole waterfall. . . . This transparent passage is followed by one of dull, opaque white, and then we come to the rocks in mid-stream, whose thick vegetation is watered by the ever ascending mist and trembles at the eternal thunder. From here to the spectator is nothing but the rippling rapid above, and the ragged sheet of heavily falling water, losing itself below in masses of rolling cloud. In the way of immediate foreground we have a cliff to the left, and before us its scattered *debris*.

1868 Church

The most original passage remains to be described. Below every waterfall there is a pool, whose motion is in great part determined by the continual rising from below of the water which the force of the cascade has driven down to the very bed of the river. A fall like Niagara actually dives and strikes the bottom, from which it continually rebounds. The effects on the surface of the pool are amongst the most curious of all the phenomena of water. One very remarkable result is that, although there may be nothing like what we are accustomed to call a wave, the water is not level; it often perceptibly rises into gentle eminences, flowing away from these in all directions. Sometimes the whole pool is visibly, though slightly domed, and this, from Mr. Church's record, appears to be the case with Niagara. There was no great technical difficulty in rendering this appearance, but Mr. Church has achieved a very great feat in his interpretation of the surface-

1868 Church markings; we have never seen the lines of currents and the stretching streaks of foam more thoroughly studied than in this picture. The difficulty of painting such a large space of water would have been great under any circumstances, but in this case, when it is covered with elaborate markings, every one of which is a result of motions and forces exceedingly difficult to analyze and comprehend, and seen from such a height that all these markings must be thoroughly mapped out, the difficulty is so tremendous that nothing but very extraordinary powers of observation and memory could have overcome it.

1870

1870 Currier CURRIER, N——. Niagara Falls from Table Rock. [1870?] (Grosvenor library, Buffalo, N. Y. Views of Niagara Falls. 1697–187–. Mat 21.)

Lithograph published by N. Currier.

Der Niagara Fall. [1870?] (Grosvenor library, Buffalo, N. Y. Views of Niagara Falls. 1697–1870. Mat 25.)

In colors, after Weld.

Die Schnellen des Niagara. [1870?] (Grosvenor library, Buffalo, N. Y. Views of Niagara Falls. 1697–187–. Mat 22.)

1870 Endicott ENDICOTT, ——. American Fall of the Niagara. [1870?] (Grosvenor library, Buffalo, N. Y. Views of Niagara Falls. 1697–187–. Mat 23.)

1870 Glover GLOVER, H. J. The great international railway suspension bridge over the Niagara river in full view of the Falls, connecting the United States and Canada, the New York Central and Great Western Railways. [1870?] (Grosvenor library, Buffalo, N. Y. Views of Niagara Falls. 1697–187–. Mat 17.)

1870 Kellogg KELLOGG, E. B. *and* E. C. Niagara and its wonders. [1870?] (Grosvenor library, Buffalo, N. Y. Views of Niagara Falls. 1697–187–. Mat 26.)

A lithograph published in Hartford, Conn., showing suspension bridge surrounded by ten small views of the Falls from various points of view.

(Large view of terrapin tower and Horseshoe Fall.) [1870?] (Grosvenor library, Buffalo, N. Y. Views of Niagara Falls. 1697–187–. Mat 27.) **1870**

Map of North America with Niagara Falls inset of Kalm-Hennepin type. [1870?] (Grosvenor library, Buffalo, N. Y. Views of Niagara Falls. 1697–187–. Mat 22.) **1870**

Ontario and St. Lawrence steamboat company. Inset of Horseshoe Fall. [1870?] (Grosvenor library, Buffalo, N. Y. Views of Niagara Falls. 1697–187–. Mat 22.) **1870**

This inset appears in "Routes from Albany to Niagara Falls, Buffalo, and Montreal."

Rapids of the Niagara Fall. [1870?] (Grosvenor library, Buffalo, N. Y. Views of Niagara Falls. 1697–187–. Mat 25.) **1870**

A poor view, apparently of the lower rapids.

SCHLITZER, FRANK CECIL. Two views of the Falls from the American shore below. Lithographed by Sage, Sons & Co. Buffalo: 1870. **1870** Schlitzer

These two colored views taken from paintings, are apparently of different dates. They show the inclined railway structure and other buildings on the slope on the American side, but the terminals are different in the two pictures.

SCHUSTER, S——. Niagara Falls. [1870?] (Grosvenor library, Buffalo, N. Y. Views of Niagara Falls. 1697–187–. Mat 21.) **1870** Schuster

Both falls are shown from the Canadian side. A very poor picture.

The three sisters, Niagara river above the Falls. [1870?] (Grosvenor library, Buffalo, N. Y. Views of Niagara Falls. 1697–187–. Mat 23.) **1870**

This very pretty view by J. H. Bufford and Sons, lithographers, Boston, shows the rapids and the river above the Falls.

1872

FENN, HARRY. Niagara. S. V. Hunt. (sc.) D. Appleton and Co. 1873. (Grosvenor library, Buffalo, N. Y. Views of Niagara Falls. 1697–187–. Mat 15.) **1872** Fenn

Taken from "Picturesque America" edited by William Cullen Bryant. 1872.

1872 Fenn

FENN, HARRY. Niagara. S. V. Hunt (sc.) N. Y. D. Appleton and Co. 1873.

In this view from above the Horseshoe Fall on the Canadian side the water effects are fine, but the details are inaccurate. A bridge is shown from the Canadian side to Goat Island in the rapids with suspension bridge and the American city in the distance.

1877

1877

The season at Niagara Falls — (Photographic visitors drawn by J. Wells Champney). (Harp. w., Aug. 18, 1877. 21:645–646.)

1878

1878 De Haas

DE HAAS, MAURITZ FREDERICK HANS. The rapids above the Falls. (1878.)

The painter of this picture was a Dutch artist, who was closely identified with American art from the time of his arrival in this country in 1859. He was a winner of many medals in this country, and a member of the National Academy of Design. This superb picture of the rapids was exhibited at the Paris Exposition in 1878 and was the subject of much comment in the press and various art journals.

1880

1880

Falls of Niagara, reprints of Hennepin, Lahontan, newspaper 1764, Ellicott, Rush, C. Williamson. (Mag. Am. hist., July, 1880. 5:47–56.)

1880

New York State. Reservation Commission at Niagara. Map and guide of the New York State Reservation at Niagara. Buffalo: (188–?)

A folded map with a description on the reverse side.

1885

1885 Fenn

FENN, ALICE MAUD. Niagara. (Art jour. 1885. 38:237–241.)

Describes the beauties of Niagara and is illustrated from drawings by Harry Fenn.

1885 Hatton

HATTON, JOSEPH. Niagara illustrated. (Art jour. 1885. 37:13–14.)

A criticism and description of the picture of Niagara by Her Royal Highness the Princess Louise. This picture illustrates the article.

WITTEMAN, ADOLPH. New bond paper map of Niagara Falls and vicinity. 7½ x 13. N. Y. A. Witteman. 1886. 1885 Witteman

1886–1889

SANGSTER, AMOS W. Niagara River and Falls from Lake Erie to Lake Ontario: a series of one hundred and fifty-three original etchings, etched on copper, from his own drawings; ed. by James W. Ward. Buffalo: Fryer. 1886–89. 1886–89 Sangster

Some fifty plates and vignettes of Falls scenery. The whole work is accompanied by a descriptive text.

1888

PHILOPPOTEAUX, PAUL. Cyclorama of Niagara. 400 x 50. (1888.) 1888 Philoppoteaux

This cyclorama was painted by the same artist that painted the "Battle of Gettysburg." Associated with him in the painting of the gigantic "Niagara" were other artists of repute. The "Cyclorama of Niagara" was opened to the public in London in 1888. The painting, so those who viewed it tell us, had decided artistic merit, and the arrangements for lighting were so superior that the exhibition was a great success, for a time. It was afterward brought to America, and exhibited with discouraging results at Chicago. Its present whereabouts is unknown.

1889

Buffalo: Some representative views collected under the direction of the Buffalo merchants' exchange, for presentation to the delegates of the International American conference as a souvenir of their visit to the city on October 14, 1889. 1889

Views of the Falls from Prospect Point, from the Canadian side, and of the Cave of the Winds.

HILL, J. HENRY. (Horseshoe Fall from Goat Island.) 1889. An etching. 1889 Hill

1891

HAYES, JAMES. A note on Niagara literature. (The bookworm. (Lond.:) 1891. 4:337.) 1891 Hayes

Contains a reference to what the author believed "the earliest engraving of the Falls."

1893

1893 Bamburgh (Bamburgh, William Cushing). Niagara Falls from uncommon points of view. N. Y.: Phoenix Art Pub. Co. 1893.

Contains eighteen views of the Falls — photographs pasted in with brief appreciative comments preceding each.

1893 Flynne Flynne, P. C. Niagara Falls. 8 x 15. 1893.

This large picture was painted for the state of New York for exhibition in the New York Building at the Chicago Fair in 1893. It embraces both the American and Canadian Falls. In 1894, Mr. Flynne presented it to the State of New York, and since then it has hung on the wall of the Senate lobby in Albany.

1893 Hopkins Hopkins, G. M. Atlas of the vicinities of the cities of Niagara Falls, North Tonawanda and Buffalo, N. Y. Phila.: G. M. Hopkins. 1893.

Of the thirty-three plates, numbers 3 and 5 show the Falls and the Reservation.

1893 Mignot Mignot, Louis R. Niagara. (A painting.) 1893.

This study of Niagara was exhibited at the Columbian exhibition in 1893.

1894

1894 Du Mond Du Mond, F. V. Niagara illustrations. (*In* Trumbull, William. Legend of the white canoe. N. Y. and Lond.: Putnam. 1894.)

These illustrations are photogravures from the designs of F. V. Du Mond, to illustrate this Indian legend of the sacrifice of a beautiful maiden to the Spirit of the Falls.

1899

1899 Waldron Waldron, Holman D. With pen and camera at Niagara Falls. Portland, Me.: Chisholm. c 1899.

Some views of the milling district and of Niagara in harness.

1900

1900 International waterways commission. Message from the President of the United States transmitting the final report of the international waterways commission upon the proposed dam at the outlet of Lake Erie. (63d Cong. 1st sess. Sen. Doc. 118.)

Contains a map of the Niagara river.

JOHNSTON, W——. *and* A. K. Quebec, Niagara, Montreal. 10 x 7½. (*In their* World-wide atlas of modern geography, etc. 5th ed. fol. Edinburgh and Lond.: W. and A. K. Johnston. 1900. P. 116.) 1900 Johnston

This small map of the river indicates the points of interest on the reservation.

1901

CUTTER *and* KOONZ. Panoramic views of Niagara Falls. Niagara Falls: Cutter and Koonz. 1901. 1901 Cutter and Koonz

Among other views a very good one of the old iron bridge to Goat Island.

UNDERWOOD *and* UNDERWOOD. Map of Niagara Falls. 8 x 9½. 1901. 1901 Underwood and Underwood

1905

SPENCER, JOSEPH WILLIAM WINTHROP. A map of the gorge of the Niagara River, to accompany a report on New discoveries in the physics of the Falls. 1905. (*In* back of his "Outline of the evolution of the Falls of Niagara: contrast with the Falls of Zambesi": for the International Zoological Congress.) 1905 Spencer

1908

BROWN, JAMES FRANCIS. The red man's fact. (1908?) 1908 Brown

BROWN, JAMES FRANCIS. The white man's fancy. (1908?)

These two paintings preserved at Niagara Falls illustrate Indian legends.

MATHEWS, CATHARINE VAN CORTLANDT. Andrew Ellicott, his life and letters. N. Y.: Grafton. 1908. Pp. 72–76. 1908 Mathews

Contains on pages 72–76 a report to President Washington of his disagreeable treatment by the British commandant at Fort Niagara. There is also a map of the Straight of Niagara to be handed to General Washington on his return.

1909

KELLER, *Major* CHARLES. Niagara River from above the Falls to Lake Ontario; prepared under the direction of Major Charles Keller. Corps of Engr's, U. S. Army. 1909. 1909 Keller

This map is a part of a "survey of the northern and northwestern lakes made in obedience to acts of Congress and orders from Headquarters of the Corps of Engr's, U. S. Army." It shows the Falls, the power houses, etc., incidentally.

1911

1911 Pennell

PENNELL, JOSEPH. Niagara Falls. (Cent., May, 1911. 82:77–82.)

Six lithographs by Joseph Pennell sketched from nature in the autumn of 1910: I. View from the railway station overlooking the Falls on the Canadian side; II. Building the power house on the Canadian side — the American Falls, below; III. Rainbows over the Canadian Falls, as seen from the Canadian side; IV. The Rapids below the upper steel arch bridge — the American power house on the left; V. The rapids below the steel arch bridge from the Canadian side; VI. The upper steel arch bridge from the Canadian side looking down stream. In these views the emphasis is laid upon the industrial aspects of the scene.

No Date

No date Beck

BECK, RAPHAEL. Niagara Falls. (Painting.)

This painting, similar to Thomas Cole's in point of view and treatment of the cataract as primitive Niagara, hangs in the Buffalo Historical Society Building in Buffalo, N. Y.

Coxe

COXE, REGINALD. The Luna Fall.

COXE, REGINALD. Study of the rapids.

Both these modern canvases hang in the Historical Building at Buffalo.

Day

DAY, W——. (Lith.) Great Horseshoe Fall. On stone by A. Picken, Jr.

This print shows the Falls from below, as a broad straight line, then an angle with the mist rising. Below there are wild stereotyped waves, and figures are seen on the rocks by the stream on the left.

These stupendous falls (the largest yet discovered) may be heard at the distance of 40 miles, the cloud of spray continually overhanging them is distinctly seen at the distance of 70 miles with the naked eye.

There are 113,510,000 gallons, or 672,000 tons of water per minute precipitated over these Falls.

Delarochette

DELAROCHETTE, L——. Bowle's new pocket map of North America divided into its provinces, colonies, etc., by J. Palairet, lately revised and improved with many additions, from D'Anville, Mitchell, and Bellini, by L. Delarochette. Lond.: N. d.

"Niagara Fall, 140 feet."

Der Niagara fluss. Verlag d. Englishen Kinstantalt v. A. H. Payne. Leipzig *and* Dresden. No date

This print shows a bridge across the upper river and the American Fall as a great smooth sheet. Goat Island is also visible.

EDWARDS, ERNEST. Niagara; photo-gravures from originals. Troy: Nimś and Knight. N. d. Edwards

Exquisite.

LOTTER, MATTHIEU ALBERT. Carte nouvelle de l'Amerique Angloise contenant tout ce que les Anglois possedent sur le Continent de l'Amerique Septentrionale savoir le Canada, la Nouvelle Ecosse ou Acadie, les treize Provinces unies. . . . avec la Floride. Gravée exactment d'après les determinations geographiques dernierement faites par Matthieu Albert Lotter à Augsburg. Lotter

SUMMARY

It may be truthfully said that no natural wonder of our world has been more universally pictured than Niagara Falls. The views have taken a multiplicity of form — maps, panoramas, engravings, wood-cuts, aqua-tints, paintings, lithographs. The earliest view, which was accepted as the correct conception of Niagara for one hundred fifty years was the famous Hennepin picture of 1697, known to all students of Niagara, and it is a curious fact that the inaccuracies of this picture persisted as a model for other artists, long after Lieutenant Pierie's more real conception had been presented to the world.

Many of the old maps of the eighteenth century, drawn for a world anxious and interested to know something of the new hemisphere, contain a record of Niagara Falls, although in many cases this is only a break in the river with not even the name attached. Some of these old maps contain curious and interesting insets giving the popular views of the Falls.

In the nineteenth century, the popularity of the panoramic views of the Falls in England and the United States gave the most widely disseminated knowledge as to their real appearance. In our own day, in books and magazines, views of the Falls under all aspects are usual and common. There are many

private collections of Niagara pictures. An especially rare collection of Niagara aqua-tints is that of Judge Alphonso T. Clearwater of Kingston, New York, a Commissioner of the State Reservation at Niagara.

Many artists have painted the Falls with varying degrees of success. Up to the present time the palm easily goes to Mr. Frederick E. Church's picture of Niagara which hangs in the Corcoran Gallery in Washington. The waters of Niagara are so vital, vibrant, and changing that their representation on canvas presents unusual difficulties, and it is not surprising that so many artists have tried in vain to picture its beauty of form and color.

Chapter X

CHAPTER X

INDUSTRIAL NIAGARA

1799

LIANCOURT, DUKE DE LA ROCHEFOUCAULT. Travels through the United States of North America, the country of the Iroquois, and upper Canada, in the years 1795, 1796, and 1797; with an authentic account of lower Canada. 2 vols. Lond.: R. Phillips. 1799. Vol. I. Pp. 221, 223, 224. 1799 Liancourt

Chippaway was formerly the chief place of an Indian tribe, which now inhabits the borders of Virginia. . . .

About a mile above the falls, two corn-mills and two saw-mills have been constructed in the large bason, formed by the river on the left. We examined, with peculiar attention, the most distant of them. It is the most remarkable chiefly on this account, that the logs are cut here into boards, thrown into the Chippaway creek near its mouth, and by means of a small lock conveyed into a canal, formed within the bed of the river by a double row of logs of timber, fastened together and floating on the water. The breaking of these is prevented by other large balks floating at a certain distance from each other, which form, as it were, the basis of this artificial canal. The water retains in this canal the rapidity of the current, and conveys the logs into the lower part of the mill, where, by the same machinery which moves the saws, the logs are lofted upon the jack and cut into boards. Only two saws at a time are employed in this mill. The power of the water is almost boundless, but the present wants of the country do not require a greater number of saws. The very intelligent owner of the mill has constructed it on a plan, which admits of the addition of a greater number of courses, according

1799
Liancourt

as these shall be required by an increased consumption. On the same principle he has built his corn-mill which has at present only four courses. The miller's dues for grinding, as fixed by the legislative power, amounts to a twelfth throughout all upper Canada, and for sawing logs to a moiety of the wood sawed.

. . . . .

An iron-mine, too, has lately been discovered near Chippaway creek. A company has associated for the working of this mine and resolved on erecting an iron-forge in the vicinity of the falls. But this they dare not establish without the governor's permission; for the mother country still persists in supplying all its colonies with its own manufactures; and refuses to relinquish a monopoly, that has already cost it that part of America, which composes the United States. But the company hope to obtain the desired permission.

. . . . .

Throughout this whole tract of country, labourers are not easily procured; and they receive, besides their board, from five to six shillings per day. The winter continues only from the middle of December to the beginning of April.

1857

1857

Articles of incorporation, together with the by-laws of the Niagara Falls Water Power Co., as amended April 11, 1857. N. Y.: Baker and Godwin. 1857.

The subscribers have associated, and do associate themselves together for the purpose of carrying on and conducting manufacturing, chemical and mechanical business, at the village of Niagara Falls, in the State of New York, by means of water power drawn from the Niagara river immediately above Niagara Falls, pursuant to the act of the Legislature of the State of New York entitled, " An Act to authorize the promotion of corporations for manufacturing, mining, mechanical, or chemical purposes," passed February 17, 1848, and the several acts passed in

View of the East Side of the Horseshoe Falls

addition thereto; and they do hereby, for themselves and their successors and assigns, enter into the following covenants and agreements, to wit: 1857

Article I.

Sec. 1. The name to distinguish the Company, and to be used for its dealings, shall be "The Niagara Falls Water-Power Company."

Sec. 2. The objects for which this Company was formed, are for carrying on such manufacturing, chemical and mechanical business as may be carried on and conducted by means of water-power to be obtained from the water of the Niagara river, immediately above the great cataract, at the village of Niagara Falls in the State of New York; and also, the construction of a suitable and sufficient navigable hydraulic canal with its gates, bridges, wharves, and other appurtenances, including the opening and improving the shore and channel of Niagara river as to navigable width and depth, so far as the same may be necessary for the purposes aforesaid, together with the exercise of all such other powers as are or may be connected therewith, or incident to the conducting of the business of the said Company, in conformity to the aforesaid act of the Legislature, and several other acts supplemental or amendatory thereof.

Sec. 3. The amount of the capital stock of the said Company shall be Five Hundred Thousand Dollars, with power to diminish the same or increase it to any amount not exceeding one million of dollars, and also to extend or change the business of the Company in the manner provided by law, subject to the provisions of the act aforesaid.

Sec. 4. The term of existence of the said Company, shall be fifty years from the date hereof, unless sooner dissolved according to law.

Sec. 5. The capital stock of the said Company shall consist of five thousand shares, and each share shall be of the sum of one hundred dollars.

1877
Siemens

SIEMENS, *Sir* CARL WILHELM. Inaugural address; delivered at the annual general meeting of the iron and steel institute held in London, March, 1877. Newcastle-upon-Tyne.: Lambert. 1877. Pp. 12–13.

WASTED WATER POWERS.

Take the Falls of Niagara as a familiar example. The amount of water passing over this fall has been estimated at one hundred millions of tons per hour, and its perpendicular descent may be taken at 150 feet, without counting the rapids, which represent a further fall of 150 feet, making a total of 300 feet between lake and lake. But the force represented by the principal fall alone amounts to 16,800,000 horse-power, an amount which if it had to be produced by steam, would necessitate an expenditure of not less than 266,000,000 tons of coal per annum, taking the consumption of coal at 4 lbs. per horse-power per hour. In other words, all the coal raised throughout the world would barely suffice to produce the amount of power that continually runs to waste at this one great fall. It would not be difficult, indeed to realize a large proportion of the power so wasted, by means of turbines and water wheels erected on the shores of the deep river below the Falls, supplying them from races cut along the edges. But it would be impossible to utilize the power on the spot, the district being devoid of mineral wealth, or other natural inducements for the establishment of factories. In order to render available the force of falling water at this and hundreds of other places similarly situated, we must devise a practicable means of transporting the power. . . . Time will probably reveal to us effectual means of carrying power to great distances, but I cannot refrain from alluding to one which is in my opinion, worthy of consideration, namely, the electrical conductor. Suppose water power to be employed to give motion to a dynamo electrical machine, a very powerful electrical current will be the result, which may be carried to a great distance, through a large metallic conductor and then be made to impart

motion to electro-magnetic engines, to ignite the carbon points of electric lamps, or to effect the separation of metals from their combinations. A copper rod 3 inches in diameter would be capable of transmitting 1,000 horse-power a distance of say thirty miles, an amount sufficient to supply one-quarter of a million candle power which would suffice to illuminate a moderately sized town. 1877 Siemens

1881

Niagara Falls as a source of energy. (Am. jour. sci., Nov., 1881. 122:397.) 1881

The conclusions of Sir William Thompson quoted from *Nature*, September 8, 1881, page 435.

1885

McElroy, Samuel. Water power at Niagara Falls. (Sci. Am. supp., Nov. 14, 1885. 20:8217–8218.) 1885 McElroy

The hydraulic power has been utilized by the hydraulic canal, Witmer's grist mill, the upper and lower races and the paper mill on Bath Island; below the falls by Witmer's grist mill at the Suspension Bridge.

Rhodes, Benjamin. Electrical transmission from Niagara. (Trans. A. S. C. E. May, 1885. 14:205–211.) 1885 Rhodes

The object of this paper, which was read at the annual convention June 10, 1884, is "to show what has been done or what may be done toward the utilization of Niagara for electrical purposes." Some account of the power already developed is given, and the future development, especially with its application to electricity at a distance, is studied and forecast.

Enough, however, has been said to show that the power of Niagara can be transmitted to a distance of 25 miles, with a great saving over the power of steam, and that with improvements in storage-batteries and electro-motors, this distance can be increased, with economy, to 100 or 150 miles. With further improvements in dynamos and insulating material to permit the use of currents of higher intensity, such as may be confidently looked for, the economical distance may be still further increased,

1885 Rhodes

until some of the present generation may see the prophecy of Sir William Thomson literally fulfilled and the power of Niagara used in all the large cities of this country.

1885 Trowbridge

TROWBRIDGE, JOHN. Niagara Falls considered as a source of electrical energy. (Sci., May 15, 1885. 5:401–403.)

The author comes to the conclusion that the facility with which energy in the shape of coal can be transported from place to place counterbalances at present the cheapness of a very remote source of energy in the shape of a waterfall.

The reasons for and against the utilization of the energy of Niagara Falls as a source of light apply also to the question of the electrical transmission of power, with this exception, that the electrical transmission of power has not reached even the perfection which systems of electric lighting have attained.

1887

1887

Utilizing Niagara. . . . (Industries of Buffalo. Buffalo: Elstner Pub. Co. 1887. Pp. 66–71.)

A review of the prospectus of the Niagara Falls Hydraulic Tunnel Power and Sewer Co. together with the report of Thomas Evershed on the undertaking and a letter of Elnathan Sweet, State Engineer and Surveyor, endorsing Mr. Evershed's views. The review calls the project "one of the most daring and colossal, yet practical, of modern enterprises."

1889

1889 Long

LONG, ELIAS A. An acre in the city. A brief treatise on land, millionaires, fortunes in real estate, Buffalo, Niagara power. No. pub. N.d. Pp. 24–30.

A brief, crisp exposition of "Niagara power, electric power as revolutionizers in the industrial world." The author's message is summed up in the following: "Let but the (1) vastness and (2) cheapness of the power, coupled with the (3) limitless raw materials of the lake regions, attainable here at (4) a saving of millions of dollars yearly on freight, and then the (5) cheap distribution to the world's markets be considered, and who can fail to be startled at the aggregate advantages presented by Niagara."

LONG, ELIAS A. Niagara power; the utilization of the world's greatest waterfall for power purposes. . . . Buffalo: The Wemborne-Sumner Co. (1889.) 1889 Long

(A) scheme for the electrical utilization of Niagara. (Elec. wld., Feb. 9, 1889. 13:71–72.) 1889

A description of a plan for erecting vertical pipes behind the Falls to catch the water and carry it downward to turbines directly connected with lines of shafting in chambers excavated under the Falls. By this means it was hoped to get the power without disfiguring the scenery.

Utilizing Niagara Falls. (Elec. wld., Aug. 10, 1889. 14:88.) 1889

A short description of the plan of the Niagara River Hydraulic Tunnel, Power and Sewer Company for the construction of a subterranean tunnel around the Falls from the upper river to the lower river.

Utilizing the power of Niagara. Nation, Aug. 8, 1889. 49:104–105.) 1889

The author holds that "the question of utilizing Niagara is one for the skill of the engineer and not for the ingenuity of the inventor." He points out that the "head" system is the only practicable one for Niagara and discusses plans for securing head.

WATTS, H. F. The Hamilton plan for utilizing Niagara. (Elec. wld., Mar. 2, 1889. 13:133–134.) 1889 Watts

"A criticism of Mr. Hamilton's plan, together with suggestions for the improvement of its electrical points."

1890

Business men's association of Niagara Falls. The water-power of Niagara applied to manufacturing purposes; the hydraulic tunnel of the Niagara Falls Power Company; an accurate description of one of the greatest industrial undertakings of the age. (Buffalo: Matthews, Northrup. 1890c.) 1890

Niagara, scenic, historical and industrial.

The great tunnel at Niagara. (Power, Sept., 1890. 12:1–2.) 1890

A description of the tunnel scheme and a bit of Niagara ancient geological history.

1890 Map and section of canals and tunnel proposed by Cataract construction company. (Eng. news, May 17, 1890. 23:462. May 24, 1890. 24:484.)

Contains also a description of the geological formations to be encountered in the development plans.

1890 Niagara Falls power company. (Eng. news, Nov. 8, 1890. 24:418.)

Gives the details of tunnel construction then in process of building.

1890 The utilization of Niagara. I. (Eng. (Lond.), Sept. 26, 1890. 50:355–358.)

Plans of the Cataract Construction Company and its efforts to procure information.

The utilization of Niagara. II. (Eng. (Lond.), Oct. 17, 1890. 50:449–451.)

A history of the discovery and geology of the Falls together with a discussion of their advantages for manufacturing purposes.

The utilization of Niagara. III. (Eng. (Lond.), Oct. 24, 1890. 50:473–475.)

A discussion of the volume and drainage area of the Falls and of the facilities for the development and use of power.

1891

1891 Bogart BOGART, JOHN. Letter as to the diversion of water near Niagara Falls. (Ann. rep'ts of the state reserv. at Niagara. Albany: 1891. 7:118.)

This letter from the State Engineer and Surveyor gives it as his opinion that the amount of water that could be diverted through the tunnel of the Niagara Falls Power Company would not affect the depth of the water flowing over the Falls to any visible extent.

1891 Long and Long LONG *and* LONG. Niagara power. Niagara shore real estate. (Buffalo, N. Y.: c1891.)

Account of the power development at Niagara, of the best residence and business sites, and the advantages of the use of Niagara power.

1891 Sellers SELLERS, COLEMAN. The utilization of the power of Niagara Falls and notes on engineering progress. (Jour. Frank. Inst. July, 1891. 132:30–53.)

An amplification of an address delivered before the Institution, May 20, 1891, and dealing with the reasons why Niagara was not used sooner, the development of the Niagara project, the advantages of the tunnel scheme and the transmission of the power to be generated. **1891** Sellers

The utilization of Niagara. VII. (Eng. (Lond.), Jan. 2, 1891. 51:14, 19–21.) **1891**

A discussion of the recession of the Falls.

The utilization of Niagara. VIII. (Eng. (Lond.), Feb. 27, 1891. 51:235–236.)

Letters on the volume of the Falls and the award of prizes in the Niagara competition.

The utilization of the power of Niagara Falls. (Eng. rec., Aug. 15, 1891. 24:174–175.) **1891**

The tunnel and its advantages, the central station, the advantages of Niagara for power development, and the transmission of the power generated.

1892

Baclé, L. L'utilisation de la force hydraulique des chutes du Niagara. (Le Genre Civil. Sept. 24, 1892. 21:342–345.) **1892** Baclé

Gives an account of the early uses of the power at Niagara, and describes the Niagara Falls Power Company's project.

Forbes, George. The utilization of Niagara. (Jour. soc. arts, Dec. 16, 1892. 41:90–97.) **1892** Forbes

A discussion showing "generally the character of the work which had to be undertaken, the objects to be fulfilled, and the extent to which these plans have been completed up to the present moment."

Herschel, Clemens. Utilization of the Falls of Niagara. (Eng. news, Jan. 23, 1892. 27:74–76.) **1892** Herschel

A discussion of the advantages of water power, the physical and legal difficulties which had to be met at Niagara Falls, the capacity of the proposed construction, and the plan of the works in progress.

The new hydraulic works at Niagara Falls. (R. R. gaz., Dec. 23, 1892.) **1892**

This article is reprinted from the Iron Age of December 8, by permission. It describes the general plan, the first steps, the general aspects

1892 Herschel and the 5,000 horse-power turbine of the Niagara Power Company's development.

1892 The Niagara Falls tunnel. (Elec. rev., Feb. 20, 1892. 19:352.)

A description of the shafts, the boring and the machinery used.

1892 Niagara mastered. (Eng. (Lond.), Oct. 14, 1892. 74:319.)

Describes the scheme of the Niagara Falls Power Company and the uses of the development.

1892 Niagara power plant. I. (Eng. rec., Sept. 24, 1892. 26:266–268.)

General plans for the utilization of the Falls.

1892 Pritchard PRITCHARD, F. E. Power transmission at Niagara. (Elec. wld., April 16, 1892. 19:258.)

"That rope drive is to figure conspicuously in the development of power at Niagara in the future remains no longer a doubt in the minds of those who have given it a fair and impartial trial."

1892 Projects for water power development about Niagara Falls. (Eng. news, Nov. 24, 1892. 28:489.)

Schemes for the development of power on the lower Niagara at Queenston and Lewiston.

1892 The utilization of Niagara. (Eng. (Lond.), Dec. 23, 1892. 54:787.)

A description of the turbines of the Cataract Construction Company.

1892 Szuts SZUTS, BELA. The utilization of Niagara Falls; scheme by Messrs. Ganz. (Eng. (Lond.), Feb. 19, 1892. 53:228–230.)

A discussion of a design submitted for the Niagara competition.

1892 The utilization of Niagara Falls. (Elec. wld., Sept. 24, 1892. 20:193–194.)

A discussion of modifications made in the original plans for the tunnel, of methods of securing power available at Niagara Falls, and of steps toward Canadian development.

1892 Werner WERNER, CHARLES H. The Niagara Falls tunnel. (Cass., June, 1892. 2:73–94.)

A historical sketch of power development at the Falls and an account of the chief features of the Niagara Power Company's development and its efforts, through investigation and competition to get the latest and best devices.

TROWBRIDGE, JOHN. Niagara, the motor for the World's Fair. (Chaut., Jan., 1892. 14:441–445.) 1892 Trowbridge

A glance at previous methods of transmitting power by electricity over long distances, and the plan by which a German electrician proposed to transmit 5,000 horse-power from the Falls of Niagara to the World's Fair at Chicago.

1893

Construction of the Niagara Falls hydraulic plant. I. (Eng. rec., Jan. 14, 1893. 27:132–136.) 1893

Test boring, surveys, monuments, tunnel power sites, best railway, etc.

Construction of the Niagara Falls hydraulic plant. II. (Eng. rec., March 11, 1893. 27:293–294.)

A map and description of the equipment at shaft no. 2, the arrangement of the power house, connections of pressure mains, and operation of air compressors.

Construction of the Niagara Falls hydraulic plant. III. (Eng. rec., April 22, 1893. 27:415–416.)

The hoisting engine, shaft cage, hoisting bucket, and system of collecting water.

Construction of the Niagara Falls hydraulic plant. IV. (Eng. rec., May 20, 1893. 27:490–491.)

Tunnel construction, method of drifting, system of drilling, electric battery, exploder, suspended track, air pipe, and drill column.

Construction of the Niagara Falls hydraulic plant. V. (Eng. rec., July 8, 1893. 28:87–88.)

Continues the description of the tunnel construction; describes the timbering and pumps and gives a diagram.

Construction of the Niagara Falls hydraulic plant. VI. (Eng. rec., Aug. 19, 1893. 28:183–184.)

Describes the tunnel brick-work with a diagram.

Construction of the Niagara Falls hydraulic plant. VII. (Eng. rec., Sept. 30, 1893. 28:280–281.)

Describes the power plant at the inlet canal, the air compressors, coffer-dam, and ice-boom. Contains a diagram.

1893 Construction of the Niagara Falls hydraulic plant. VIII. (Eng. rec., Oct. 21, 1893. 28:328–329.)

Describes with a diagram the stationary and traveling derricks and rock drills.

Construction of the Niagara Falls hydraulic plant. IX. (Eng. rec., Nov. 4, 1893. 28:360.)

Describes the dump cars, the wheel pit, shaft, etc., with a diagram.

1893 The five thousand horse-power turbines for the Niagara power plant. (Eng. news, March 30, 1893. 29–294.)

The conditions under which designs were prepared and plans submitted to the International Niagara Commission, together with a description of the turbines and their method of regulation.

1893 Grimshaw GRIMSHAW, ROBERT. Three million horse-power in winter. (Cass., Jan., 1893. 3:173–179.)

Illustrated by some fine photographs of winter scenery at the Falls.

1893 Herschel HERSCHEL, CLEMENS. The Niagara turbines. (Cass., March, 1893. Pp. 387–389.)

This article contains detailed diagrams as well as descriptions of the wheels.

It is but natural that a work of the magnitude and novelty appertaining to the utilization of the first lot of 100,000 horse-power at the Falls of Niagara, should have given rise, in the course of its construction, to many new methods and structures. Some of these, as for example, its most noted characteristic, the tunnel tail-race, lined with brick, and the special construction of the portal of the tunnel; the wheel pit slot of the Central Power Station, instead of the usual single wheel-pits; the setting of the wheels directly over their branch tail-race, and deepening the slot to form this branch tail-race and other features of the work, have already been referred to and described in this magazine.

1893 Munro MUNRO, J. Electricity from Niagara. (Chambers' jour., March 25, 1893. 70:177–180.)

A historical survey of power development at the Falls with special reference to the Niagara Falls Power Company's project together with a

discussion of the problems encountered, and the advantages of Niagara Falls as an industrial center. 1893 Munro

SEYRIG, WILLIAM. L'Utilisation du Niagara. (Le Genre Civil. Feb. 4, 1893. 22:224–226.) 1893 Seyrig

Account of the Niagara Falls Power Company's plan and equipment.

STILLWELL, LEWIS BUCKLEY. Electric power generation at Niagara. (Cass., July, 1895. 8:253–304.) 1893 Stillwell

The author, an electrical engineer and assistant manager of the Westinghouse Electric and Manufacturing Company, had under supervision the installation of electric apparatus at Niagara Falls. The "apparatus constituting the system" adopted is described, a detailed description of the generators is given, and an account of the "means adopted for delivering these currents to the supply circuits which convey them from the powerhouse to the premises of the users of power."

Electricity as an agent for transmitting and distributing power has received its most weighty endorsement in its adoption by the Cataract Construction Company, of New York, for their great project at Niagara. No enterprise of modern times, involving special and extraordinary engineering problems, has been more carefully, more patiently, more systematically or more intelligently studied than has the utilization of this, the greatest water power in the world. The officers and directors of the company, controlling financial means ample for their purpose, have, for five years, energetically and persistently endeavored to avail themselves of the best resources of modern engineering science. Confronting a problem without precedent in its magnitude, and almost without parallel in its significance, they have attacked it with energy and ability of the highest order, studied it with keen insight and sound judgment and, in solving it with success, have contributed a chapter of rare interest and meaning to the history of industrial progress.

The utilization of Niagara for industrial purposes imposes upon those undertaking it a responsibility far beyond that which is measured by the capital invested. Science is cosmopolitan; she recognizes no boundary of race or nation; and engineering

1893
Stillwell

science of the twentieth century, in passing judgment upon the methods and apparatus employed, while not failing to take into consideration the difficulties and limitations imposed by the boundaries of our present knowledge, will allow no excuse for failure to find out and use the best means known to our age.

It is, therefore, a source of profound gratification that, from the outstart, the policy of the company has been characterized by a breadth of view commensurate with the far-reaching importance of the enterprise. The directors have allowed no local or even national prejudice to bias their judgment. They early threw the lists wide open and in the original competition which they inaugurated, the international commission passed upon no less than twenty-two plans covering practically the whole known range of electric, hydraulic and pneumatic distribution of power, and originating from places as far east as the city of Buda-Pesth, and as far west as San Francisco.

It must be gratifying to Americans that under these conditions a system developed by an American company has been adopted, but for the recent rapid advancement in engineering science which has made this work possible, America is in no position to claim exclusive credit, if she would. In the plans for the hydraulic plant, Switzerland, the land of water powers, shows the way, while in the design of the great electric generators, the most powerful as yet produced, Great Britain is represented directly in the excellent general form of construction adopted, which was proposed by Prof. Geo. Forbes, and indirectly in the work of Hopkinson, Kapp, Thompson, Mordey and others, whose careful study of the principles underlying the construction of electrical machinery has done much to make it possible to design a machine so far beyond the range of actual experience, in full confidence that the results predicted from theory would be realized in practice. Perhaps no country is more largely or more creditably represented in the great Niagara installation than Smiljan Lika,—that sturdy little province on the Adriatic, which has honored itself by producing Mr. Nikola Tesla, and were it possible to

trace to its true source each one of the great number of ideas embodied in the complete installation, it is probable that we should find nearly every civilized nation represented — England, America, Switzerland, France, Germany, Italy, some in greater degree, some in less, but all co-operating to achieve what is, beyond question, one of the most significant triumphs of nineteenth century engineering skill. 1893 Stillwell

The utilization of Niagara. (Dub. rev. sci. not. April, 1893. 112:435.) 1893

The advantages of the Falls as regards engineering facilities are cited. Estimates are given of the volume of the Falls, and an account of the Niagara Falls development, and the views of Professor Forbes are exploited.

1894

BROWN, CURTIS. The diversion of Niagara. (Cosmop., Sept., 1894. Pp. 526–545.) 1894 Brown

A historical account of power development on the Niagara, an untechnical description of the Niagara Falls Power Company's plant, other developments on the Niagara and the transmission of power to great distances.

(The) Falls of Niagara and its water power. (Nature, March 22, 1894. 49:482–486.) 1894

A technical description of the works of the Niagara Falls Power Company.

EDWARDS, E. JAY. The capture of Niagara. (McClure, Oct., 1894. Pp. 423–435.) 1894 Edwards

A discussion of the purpose of the power plant, the organization of the power company, the difficulties of the work, the various constructions, the commercial problem, and the transmission of the power generated.

It was the first intention of the engineers to carry the electric current from the water-house by means of wires stretched through a subway conduit, whose beginnings may now be seen at a point near the power-house. But it has been discovered that the construction of such a conduit will be too costly, and the electricity is to be transmitted by overhead wires.

1894
F. C. H.

F. C. H. Utilisation des chutes du Niagara. (La Genre Civil. Aug. 4, 1894. 25:216–217.)

Describes the canal, the wheel pit, the tunnel, the turbines and the dynamos.

1894
Geyelin

Geyelin, Emil. Geyelin-Jonval turbines in the plant of Niagara Falls Paper Company. (Eng. news, April 5, 1894. 31:278–279.)

A discussion of the problem and how it was met by the designing engineer.

1894
Gillette

Gillette, King C. The human drift. (Bost.: New Era Pub. Co. 1894. Pp. 87–89.)

Description of a scheme for the formation of a "United Company" consisting of all the people and having for its object the control of production and distribution of the necessities of life. The writer takes the position that "under a perfect economical system of production and distribution, and a system combining the greatest elements of progress, there can be only one city on a continent, and possibly only one in the world." The city in question would, because of power possibilities, be located on both sides on Niagara Falls. The Falls would be protected from desecration by developing the power on pipe lines laid between Lakes Erie and Ontario, west of the Falls.

1894

Inverted Geyelin-Jonval turbines at Niagara Falls. (Eng. rec., April 7, 1894. 29:297.)

The wheel pits, turbines and superstructure gears.

1894
Johnson

Johnson, Wallace C. New development of power at Niagara. (Cass., Feb., 1894. 5:326–330.)

The use of waste water for the development of power by the Cliff Paper Mill.

Johnson, Wallace C. The pulp mill of the Cliff Paper Company of Niagara Falls, New York, *and* discussion. (Trans. A. S. C. E. Aug., 1894. 32:214–230.)

The paper deals with the use of waste water and gives numerous views and diagrams.

1894
Le Sueur

Le Sueur, Ernest A. Commercial power development at Niagara. (Pop. sci. mo., Sept., 1894. 45:608–630.)

A technical description of the methods employed by various commercial interests in the application of Niagara power.

1894
Le Sueur

That this situation is the finest in the world for developing mechanical power has long been realized, but the local demands at Niagara were comparatively trifling, and only lately have our facilities for transmitting power over distances become sufficiently developed to warrant such an undertaking as is now in hand. The power company does not, however, look entirely to distant points for consumers of their output; on the contrary, a very large amount will be used almost on the spot by manufactures which are now moving to Niagara. The variety of purposes to which this power will be put may be gathered from the fact that they are as diverse as the manufacture of " mechanical " wood pulp and the smelting of aluminum.

There are already at the falls a few establishments using power developed by turbines, and which have been quietly at work for years. There is a canal known as the Hydraulic Canal on the American side, skirting the city of Niagara Falls, and terminating on the cliffs, half a mile below the cataract. There are a number of mills here which, for the most part, however, utilize only a fraction of the total fall available, probably for the reason that when they were built there were not in existence the high-grade water wheels suitable for great head that are on the market to-day.

People in general have the idea that the Niagara water power is inexhaustible, and so it probably is, so far as human requirements go. There are, however, some tolerably close data on which to figure the total horse power. The Lake Survey Board and Mr. R. C. Reid, examining the matter independently, have come to a very fair agreement in their conclusions on this point. From their figures it would appear that the average flow is about 270,000 cubic feet per second, and this is almost exactly the same as the almost unthinkable quantity of 1,000,000,000 pounds per minute. A horse power of work is the equivalent of 33,000 foot pounds per minute, and as the weight above mentioned falls 161 feet, the horse power of the total is expressed as follows: $161 \times 1{,}000{,}000{,}000 \div 33{,}000 =$ close on five million.

1894
Le Sueur

Owing to the lack in full efficiency of even the best commercial turbine wheels, we may take the limit of power that could be developed as about 4,000,000 horse power.

The average power is not departed from to any great extent at different seasons, as is the case with other water powers, because the spring thaws and summer droughts affect hardly at all the level of Lake Erie, from which the falls get their supply.

The system of Great Lakes above Ontario would require a year in order to have their level reduced by three feet and a half by even the enormous drain of a thousand million pounds of water per minute above referred to, supposing the system to be entirely cut off from its normal supply. A paper by Mr. R. C. Reid before the Royal Scottish Society of Arts in March, 1885, gives the following data: Total water-shed area down to Niagara, 290,000 square miles; total lake surface, 92,000 square miles; average rain-fall in the lake district, thirty-six inches — and that we may assume twenty inches annually of evaporation and absorption, leaving sixteen inches over the whole area finding its way to the lakes. From the lake surface proper, there occurs evaporation to the extent of twenty-four inches per annum. Further, in reference to the enormous storage capacity of the system, he shows that "it would take six months for the full effect of a flood in Lake Superior to be spent at Niagara Falls." It is easy, therefore, to understand how little fluctuation of level there can be due to seasonal variation in rainfall. Thus we see that quite apart from the fact of the vast volume and head available, and of there being no necessity for building a dam to back up the water, the situation is peculiarly favorable to the development of a constant power all the year round.

In spite of the generally equable level of Lake Erie, there are sometimes very considerable fluctuations, not of volume, but of distribution, due to high winds sweeping the length of the lake and causing a considerable banking of water at the end blown into. Sometimes such storms have lasted for days, and have had a very noticeable effect in increasing or diminishing the volume going

over the fall. A more serious cause of low water is an ice jam at the head of the Niagara River. It is on record that in March, 1847, the water practically ceased to flow, "not enough going over to turn a grindstone," as a local paper had it at the time. These two circumstances do not, however, affect the evenness of the flow to any extent worth mentioning compared with the seasonal variations in rivers in general. 1894 Le Sueur

The total fall between Lakes Erie and Ontario is three hundred and twenty-nine feet, and is made up as follows: From Lake Erie to the head of the falls, seventy feet; the falls, one hundred and sixty-one feet, and below to Lake Ontario, ninety-eight feet. Consequently, the total power running to waste is more than double the five million horse power on the falls. An idea of the proportion that this total bears to what may be called the world's consumption of power may be had from the fact that it is computed to be equal to the total of all the steam-generated power in the world.

The geographical situation of the falls with respect to nearness to the at present great power-consuming centers is, as hinted above, not quite all that could be desired; but there are, nevertheless, several cities within reach, electrically speaking, which will use an enormous amount. Buffalo may be said to be next door, and Rochester is within easy reach. In the not too distant future we may expect to see the great electrical manufacturing works in Schenectady operated, as is meet, by electrical power from Niagara.

The power company has, however, made branch track connections between the territory owned by it and three important railway lines which all pass within a few miles of the property. These connections and the good freight rates which have been contracted for in various directions, together with the cheapness of power, will in all likelihood attract to the spot manufactures besides those which have already undertaken to go there, to an extent that will make it the foremost power-consuming center in the world.

1894
Le Sueur

The chief piece of work in connection with the power installation has been the construction of what, in almost any other situation, would be termed the tailrace. In this case the head utilized is so great that what is ordinarily understood by a tailrace would be an artificial chasm of abysmal proportions that would almost require illumination other than the natural to be visible to the bottom at midday. Instead, a tunnel has been excavated, of which the dimensions are so remarkable as to make it unique among engineering exploits of the kind.

The location of the power house, on account of difficulty in acquiring sufficient adjacent lands and rights of way and for other reasons, is not very close to the falls. The Cataract Construction Company has established itself about a mile and a half above the American Fall, and has dug a canal of considerable width, of a depth of twelve feet, and length fifteen hundred feet. Along its edge for a distance of at present one hundred and forty feet is dug a great trench or slot one hundred and sixty feet down, with arrangements in the form of gates in the masonry wall separating it from the canal, by which water may be admitted to penstocks placed vertically in the slot and supplying the turbine wheels. A penstock, as many of our readers are aware, is a great tube, usually, in these days, of boiler plate, of a diameter running up, it may be, to thirteen feet, conveying water under head into the wheel case in which the turbine revolves.

In the present instance the penstocks, which are seven and a half feet in diameter, seem very small, considering that they each supply a pair of wheels of five thousand horse power, but that is on account of the enormous pressure under which the wheels work, giving a greater power for a given volume of water than with the smaller heads more commonly used.

The turbines discharge their waste water into the tunnel above referred to, which is no less than six thousand seven hundred feet long, and which discharges into the chasm below the falls just past the Suspension Bridge.

The details of this tunnel, which was excavated through three

shafts, one in the face of the cliff and two vertical ones, are as follows: Length, six thousand seven hundred feet, and sectional area three hundred and eighty-six square feet throughout, the average height and width being about twenty-one and nineteen feet respectively. The cross-section somewhat resembles a horse-shoe. The excavation was much larger than the finished inside dimensions, on account of the subsequent lining with four courses of brick. The mouth of the tunnel has, besides, a lining on the top and sides of iron. The work has been done most substantially and is built to stay. The tunneling was done through strata of limestone and shale, and harder material was met with than had been expected in the beginning, so that the three million cubic feet of excavation has cut a very important figure in the total cost of the power plant. The tunnel has a grade of 0.7 per cent (seven feet fall per thousand length) and runs directly under the city of Niagara Falls to the lower river level. 1894 Le Sueur

The work of excavation was carried on on three benches, dividing the total height of twenty-six feet about into three equal portions.

The whole undertaking has been so entirely novel in many ways that the engineers in charge have had their resources taxed to the utmost in overcoming the various difficulties that presented themselves during the design and construction of the power house, electrical and hydraulic apparatus, and tunnel. The power-house building is as yet of comparatively small proportions, but is intended to be enlarged as the number of dynamos and turbines is increased. It might be thought, and was thought at first by some of the projectors of the scheme, that the great amount of power that was to be developed would admit of considerable subdivision, not only of the units of power production (each unit consisting of a turbine and generator), but also of the ways in which the electrical power would best be sent out to consumers.

As already mentioned, a number of manufacturing establishments are locating themselves on the property owned by the Cataract Construction Company, and to these it would at first

1894
Le Sueur

sight seem natural and best to deliver electrical power straight from the power-house generators to their motors, seeing that this could easily be done without much loss of voltage on the carrying line; and, on the other hand, for distant work, as at Buffalo and Rochester, to use a high potential on the line with transformers at the consuming end or at both ends. It has, however, been decided not to thus take advantage of the mechanical subdivision of the plant to use different types of generators for different kinds of work, but to adopt as a standard one good form of machine and use it throughout, at least until the plant is increased.

Perhaps the most remarkable consequence of this step will be that the Pittsburg Reduction Company, which manufactures metallic aluminum by the action of electricity upon certain compounds of that metal in a state of fusion, and which expects to use some thousands of electrical horse power when established at the falls, will receive it in the form of an alternating current, which will be passed into an alternating-current motor driving a direct-current, low-voltage generator furnishing at last the desired electrolyzing current. It has seemed best to submit to this complication of apparatus in order to gain the advantage of entire uniformity and interchangeability of power units in the generating plant. Of course, if the power company were to put in a direct-current dynamo for the benefit of the Reduction Company, all that would be necessary would be to send the current over a wire straight to its work; and it seems remarkable, in view of the thousands of horse power required, that the extra expense of a motor and dynamo to transform this quantity appears preferable.

The electrical power unit which has been decided on after the most exhaustive and presumably competent, expert examination of the requirements of the situation, will be of a capacity for continuous work of five thousand electrical horse power (or three thousand seven hundred kilowatts), and will be directly connected with a pair of turbines of similar power. All the generators will be mechanically identical in construction and have parts interchangeable with each other. The advantage of this,

besides the obvious one of having a single set of spare parts suffice against the breakdown of any machine in the station, is that, from a point of view of the electrical aspect of the case, of the machines being able all to be put in parallel, as it is called. The expression may not be a familiar one to some of our readers, and the following hydraulic analogy may be of service in leading to an understanding of what is meant by it. Let us assume that we have several pumping engines of equal power, and that we are using them all to pump water from one reservoir into another at a higher level. Obviously the total amount of water pumped will be what a single machine handles multiplied by the number of them. Had, say, one of the pumps been weaker than the others — had it, that is, not been strong enough to force water up to the height that the others did — the result would be that, instead of doing any work when put, as we may say, in parallel with the others, it would have been unable to withstand the head, and water would have forced itself back through it into the lower reservoir. The same way with dynamos, or generators as they are usually called when referring to the machinery in a power as distinct from a lighting station. The advantage of working in parallel is, that if we have, say, six machines all "pumping" current into the same mains and one breaks down, we may take it out of circuit, and, by temporarily overloading the other five, which can always be done for a short time with good machines, keep on supplying full current to consumers. Should the power company have decided to put in a special machine for aluminum, and other special ones for other local work, and still more for distant work, each would have its own circuit, and, if it broke down, the whole dependent system would be idle until repairs were completed. One of the great aims of the company appears to be to insure the permanence and continuousness of their power service — which is, of course, of the utmost importance to manufacturers.

1894
Le Sueur

A remarkable method of construction—not, however, unique—is employed in the generators to secure means for direct coupling to the turbine shafts. These latter are vertical, and

1894
Le Sueur

come up over one hundred and forty feet out of the wheel pits from the rotating water wheels, which make two hundred and fifty revolutions per minute. In order to obtain direct driving — that is, without the intervention of toothed or friction gearing, or belt or rope driving — the revolving portions of the generator are arranged to rotate in a horizontal instead of, as is usual, a vertical plane.

A dynamo of any type whatever consists, as is well known, essentially of two portions, one of which possesses motion with respect to the other, viz., the armature and the field magnets. Since the field magnets are almost invariably much heavier and much less compact than the armature, the latter is usually chosen as the moving part. In the case under discussion the contrary has been decided on, the armature being fixed and the field magnets rotating. This gives certain advantages in the matter of less complicated electrical connections and of dispensing with the armature's rubbing collectors altogether; it also gives the advantage — much more important in this case than with smaller machines — that, since the revolving magnets are arranged on a ring and point inward, the attraction between them and the armature core tends toward neutralization of the strains of centrifugal force. The greatest advantage, however, attained by this method, and again one which is of far greater value in the present case than in ordinary practice, is the high degree of insulation possible with fixed armature coils and connections. The requirements that had to be met in the way of limiting the centrifugal strains were that the product of the sum of the weights of the revolving parts in pounds and the square of their velocities in feet per second should not exceed eleven hundred million. The weight of the moving parts of each dynamo was also limited to eighty thousand pounds, while the weight of the turbine and its shaft amounts to seventy-two thousand pounds.

This whole weight of seventy-six tons acts in one vertical line — i. e., that of the turbine shaft — and revolves two hundred and fifty times per minute. It would have been very difficult to

construct thrust bearings to take up the whole of this strain, and a hydraulic balancing piston has been resorted to for supporting it. This device is simply a circular piston fast on the vertical turbine shaft, set in a vertical cyclinder. The supporting force consists of hydraulic pressure admitted to the under side of the piston. This pressure is derived simply from the water in the penstock supplied to the turbine, and when the latter is working under full gate — that is, is taking water to its full capacity — the pressure in the penstock is decidedly less, just as the pressure in a water pipe is partly relieved by the opening of a faucet. This causes the supporting force on the under side of the piston to materially decrease, and a thrust bearing — that is, a bearing adapted to withstand either pressure or pull, so as to hold the shaft against the tendency to end play — has to be resorted to in order to take up the difference. As a matter of fact, the difference between the supporting force when the flow is a minimum and that when the gate is wide open is about two tons in the seventy-six. The way this is handled is to arrange the area of the piston and the depth below the upper water level so that at minimum flow the supporting pressure will be about one ton more than the total weight, and at full gate about the same amount less. At the normal rate of working there is very little to be taken up by the thrust bearings. 1894 Le Sueur

An idea of the magnitude of the proportions of the generators may be gathered from the fact that the designers were limited in the size of base plates that they could use by the inability of the railways to transport, even by specially large and powerful cars, pieces of proportions originally designed from the factories to the falls.

It is stated that, had it not been for the tariff restrictions imposed on the importation of electrical machinery, the generators would probably have been purchased abroad. As it was, they, as well as the motors which will operate on their circuits, are the work of a great Pittsburg company. In the case of the turbines the design was by a Geneva firm, and the construction mainly

1894
Le Sueur

done in Philadelphia. Certain of the fittings were French, and the governors Swiss.

One of the details in the power house is a traveling crane capable of handling pieces weighing up to fifty tons, which commands every portion of the floor of the building. The presence of this piece of apparatus is of the greatest importance in the case of anything going wrong with one of the generators or turbines. With its assistance any portion of either of these ponderous pieces of mechanism which may need repair can be moved with the greatest expedition, and a spare interchangeable part put in its place. Frequently in an installation of heavy machinery, although perhaps much less ponderous than these in question, a break occurs which may cause a shut-down of many hours, when, if sufficiently powerful means of moving heavy parts were at hand, the damaged piece could be replaced in a comparatively short time. A traveling crane of this description, as most of our readers are aware, consists of a long carriage having a pair of rails on which runs the crane truck carrying the lifting machinery. The long carriage, which is supported a suitable height above the floor, stretches across the width of space to be commanded, and itself has a sideway movement on several supporting rails which run the length of the space to be operated over. Thus by a combination of the two movements the crane truck commands the whole floor.

During the work of assembling the penstocks, wheel cases, turbines, etc., at the wheel pit, a view of this great slot with its contents was wonderfully impressive in giving an idea of the vastness of the whole enterprise. The great depth of this long, narrow pit, which made it impossible to see to the bottom except with the assistance of lamps in the lower part, the mysterious-looking pipes (the penstocks) rising vertically, new sections being constantly added much in the same way that a stovepipe is put together, except for the permanence given by the heavy riveted seams, and the enormous power and flexibility of operation of the immense traveling crane which rapidly conveyed in every

direction great masses of iron and steel obedient to the turn of a switch, made a combination of impressive effects not quickly forgotten. 1894 Le Sueur

. . . . .

It may be mentioned that, to withstand the very considerable hydraulic pressure at the lower part of the penstocks, these tubes are built of thicker and thicker plates from the top downward.

There has been very little criticism of the mechanical details of construction so far referred to; on the contrary, very little can be said except in praise of the fertility of resource and high general competence of the engineers who have had this work in hand. With regard, however, to the particular design of the generators from an electrical rather than a mechanical standpoint much and lavish criticism, if not condemnation, has appeared in various quarters. Whether the grounds for this criticism are well founded or not it would be presumptuous at this time to attempt to declare, but we may say that where, as in this case, one man has had practically the entire control of the design of the electrical apparatus, we may usually look for, rather than be surprised at, a great amount of setting up of individual opinion against the views which he may embody in practice, often a good deal irrespective of the probably cogent reasons which may have induced him to adopt the course in question.

Without attempting to decide between the various views which are plentifully to hand in criticism of certain electrical details in the design and proposed method of utilizing the current of the generators, we may glance at what has been decided on, and review the more important points raised in connection therewith.

In the first place, the use of an alternating as opposed to a direct current was decided on, as was to have been expected. The development within the last year or two of alternating-current motors has rendered possible the distribution of electricity for power (as opposed to lighting) purposes over distances before almost out of the question. It has been for a number of years past possible to transmit large quantities of electrical energy for

1894
Le Sueur

lighting which was not suitable for running the then known motors. The method of electrical distribution for lighting purposes that is used in cities is available also for transmission to considerable distances. It consists, as is well known, of a dynamo supplying current at a high voltage to the street lines, and a system of transformers each taking a portion of this current at high voltage and giving in return a current of greater amperage or volume and of lower voltage for house consumption, the object being simply to avoid loss of voltage or pressure by transmitting a heavy current over a light wire. As this may not be quite clear to every reader, it may be as well to say a little more about it.

The energy of any current is determined by and is equal to the product of two of its properties, its volume or amperage and its pressure or voltage. Letting C represent the amperes and V the voltage, we have that the energy = CV. In passing any current over any wire there is a loss of voltage determined by and equal to the product of two things — i. e., the amperage of the current and the resistance of the wire: so we have loss of voltage = CR. Now, if we have two currents — one, say, of ten amperes and one volt, and the other of one ampere and ten volts — the energy will be the same, or ten watts as it is called. If we pass both through a given resistance, R, we shall have a loss of voltage (= CR) ten times greater in the first than in the second case. But a given loss of voltage amounts to only one tenth as much energy (CV) in the second case with C = one ampere as it does in the first with C = ten amperes, so that with only one tenth the given loss of voltage the energy lost will be only one one-hundredth that lost in the first case. What it amounts to is that the loss in passing a given amount of electrical energy through a given resistance is proportional to the square of the current, or amperage, and consequently inversely proportional to the square of the pressure, or voltage.

If, therefore, current is used in a house at fifty volts and transmitted to the house at one thousand volts, the loss will be only one four-hundredth as much over a given wire as it would be if

transmitted at fifty volts. The advantage that alternating currents have over direct for long-distance transmission is that they may easily be transformed up or down — that is, their voltage at the generating end may be increased (at the expense, of course, of their amperage) and reduced at the consuming end. In point of fact, it is frequently and usually unnecessary to employ such devices at the generating end, for the reason that the generators themselves can work perfectly well at the high voltage requisite to transmit. The objection to using the same high voltage on the consuming machinery is simply that there is more danger of accident with numerous small motors scattered in various places and in the hands of unskilled persons than in a power station containing only two or three highly guarded machines attended by trained operatives. 1894 Le Sueur

. . . . .

In connection with the Niagara Falls work there is the further advantage which the alternating current has over the direct, and that is what may be termed the "flexibility," commercially, of the former. The alternating-current machines operated in parallel at, say, two thousand volts, may have a portion of their current taken from them at that voltage for use in the immediate neighborhood and the rest transformed up for distant transmission.

. . . . .

Lately, and particularly owing to the brilliant work of a young man, a native of Smiljan Lika, a border country of Austria-Hungary, by name Nikola Tesla, there have been devised forms of apparatus, generating as well as consuming, by means of which alternating currents may be economically used for operating motors. To express it very roughly, his method amounts to arranging an armature within a magnetic ring and causing opposite magnetic poles to revolve around the ring so as to cause rotation of the armature.

The operation of these devices is preferably by means of a polyphase alternating current — that is, a flow of electricity having more than one pulsating current.

1894
Le Sueur

Before finally deciding on what system of transmission to use, the Cataract Construction Company asked for plans for a system for the purpose from a number of electrical engineering establishments. Twenty-four distinct ones were submitted, more than one of the tendering companies having sent several different plans to be chosen from. No individual one was, however, accepted *in toto*, but instead a design was adopted embodying such points of value as could be assembled in one suitable type of machine, and the Westinghouse Company received the contract for it. The system on which the generators work is the Tesla two-phase, and is notably peculiar on account of the low periodicity of alternation.

The number of pulsations of commercial alternating currents is usually over one hundred per second and is frequently double that amount. The reasons for this high frequency are mainly two: The first, that with any given alternating-current dynamo the number of alternations depends directly on the speed, and, as this must usually be high in order to get as much work as possible out of the machine, the periodicity is also high. The second reason is that in lighting work it is, of course, highly undesirable to employ a current of which the pulsations are so slow as to leave the incandescent filament or the arc visibly dimmer between separate beats, as we may call them, than during the passage of the full current strength. In the case in hand one is impressed with the effort that has been made to steer a middle course in the design of the generators so as to obtain a portion of the advantage of the direct current for motor work and of the alternating for transformation. The periodicity for the first portion at least of the electrical equipment is to be as low as twenty-five per cent, and this at once limits the scope of the use of the current in the matter of electric lighting. Prof. Forbes states that lighting by the current direct is a comparatively small portion of the work in contemplation, and that the plant is rather to be regarded as essentially for power distribution. The expression, "lighting by the current direct," is used because a very important branch

of the power work will be the lighting of the city of Buffalo. 1894 Le Sueur
This is at present done by the ordinary direct-current arc machines operated by engines of some three thousand horse power. In changing over to the Niagara Falls power the whole electrical system will be untouched, but the engines will be replaced by motors operated by current from the falls station. . . .

The voltage at which the first installation of generators is to operate is somewhat over two thousand. Considering the perfection to which European practice has been carried in the construction of alternating-current machines for much higher electrical pressures than the above, it seems strange that this voltage should have been decided on in a situation where one would expect the very highest degree of perfection to be attained. It is stated, however, that it was largely on account of the comparatively backward condition of that branch of electrical engineering construction in America that the voltage had to be placed so low.

In a case like the present one, where the power station will be under the supervision of skilled engineers, and not merely of men whose chief qualifications are those of sobriety and an ability to stay awake at night, there appears no sufficient reason why the generators should not be operated at five times the voltage named. The fact of the armatures in these machines being fixed gives, moreover, additional security against danger consequent on such high voltage on account of the very much more perfect insulation possible.

The advantage, of course, of using a very high electrical pressure lies in the principle stated above of the loss in sending a given amount of energy over a given wire being inversely proportional to the square of the voltage. . . .

Intimately associated with this question is the problem of how to convey current at this tremendous potential of twenty thousand volts to distances. An idea of what it means may be had from the facts that two thousand is relied on to be sufficient to instantly kill a human being, and that the energy of a current given up in

1894
Le Sueur

passing through any given resistance varies as the square of the voltage.

The chief difficulty to be met in such line construction is that of efficiently insulating the wires. If any one attempted to use a line insulated merely as an ordinary telegraph line is, there would be an enormous loss, amounting practically to the whole of the transmitted current, in moist weather, by leakage over the damp surface of the glass or other insulators. The remedy for this leakage would, however, be a comparatively simple matter by means of well-known oil-holding arrangements for the insulators were it not for the further fact that it is imperatively necessary not to have the two wires, the going and return ones, farther apart than can not be avoided on account of what are known as the effects of self-induction. The wires strung on telegraph poles would have to be so far apart in order to insure their never, by any possibility, coming in contact, that the self-induction losses would make that method impracticable.

. . . . .

The evil effects of self-induction are directly proportional to the number of alternations of the current in a given time, and consequently the twenty-five-period current adopted for the Niagara Falls work is highly advantageous from this point of view.

The so-called " skin-resistance " of an alternating current circuit is, in brief, due to the fact that an alternating current penetrates only a short distance into the body of the metal of which the carrying wire is composed, instead of, as in the case of a direct current, flowing across the whole cross-section of the wire in an even manner. This also is less serious the lower the periodicity. . . .

. . . . .

The form decided on in which to construct the conveying lines is that of a conduit or subway of large proportions. One which has been already constructed for a length of half a mile is as

Wide World Photos

AIRPLANE VIEW OF NIAGARA FALLS

Taken from an American Army Airplane showing the Canadian or Horseshoe Falls, the American Falls and the Rapids above and below the Falls

follows: The walls are arched, and the width is greatest at about two thirds of the height. The conductors are carried on insulated brackets along the sides, spaced at intervals of thirty feet. The subway is lined with concrete, and manholes at intervals allow of access; besides, there are small pieces of pipe let in at the bottoms of the manhole ducts for the purpose of inserting such wires as may from time to time be required to tap the line conductors. The subway is five and a half feet high and three feet ten inches wide. A track runs along it, and the line inspectors will make their trips on an electrically propelled car; heavy wire screens the height of the subway, extending on both sides of the track, protecting the occupants from any possible discharge from the main conductors. 1894 Le Sueur

The Cataract Construction Company expect to be able to deliver power in Buffalo at a cost per horse power, for twenty-four hours a day yearly, greatly below the cost of steam power as now produced in Buffalo with coal at one dollar and a half per ton. The generators are expected to operate at five thousand horse power each, with an efficiency of ninety-eight per cent on the power delivered to them by the turbines, and there will be only three and a half per cent drop of pressure in transmitting at twenty thousand volts to the northern part of Buffalo. This last appears wonderful when we consider that it is less than the drop from the generators of an electric railway system to the motors of cars within as short a distance as half a mile, quite apart, moreover, from the extra losses in the latter case due to imperfect trolley contacts. It is hoped also to transmit power before long to the Erie Canal, on which at the close of last season there was an interesting development in the line of electrical canal-boat propulsion. . . .

Limits to the profitable development of water power. (Eng. news, Oct. 4, 1894. 32:276–278.) 1894

The plans of the Niagara Power and Development Company for a tunnel and model city. Remarks on the speculative nature of investment in power development for which there is no immediate market.

1894 The power stations at Niagara. (Sci. Am. supp., Feb. 3, 1894.)

A quotation from *Power* dealing with the Niagara Falls Power Company's development.

1894 Suplee. SUPLEE, HENRY H. An interesting hydraulic power plant. (Cass., Nov., 1894. 7:85.)

A description of the Niagara Falls Paper Mill, the unique features of its machinery, wheels, penstocks, transmission capacity, etc., with views and diagrams.

1894 Recent work of the Cataract Construction Company. (Nature, May 3, 1894. 50:11.)

Gives an account of the uses of the power with a description of the construction and unique features of Forbes's dynamo.

1895

1895 Abbott. ABBOTT, ARTHUR VAUGHAN. Industrial Niagara. (R. of R., Sept., 1895. 12:295–299.)

A description of the Niagara Falls Power Company's plant together with a brief discussion of the industrial utilization of the power developed by that company.

1895 Abbott ABBOTT, LYMAN. Niagara Falls in harness. (Outl., Nov. 16, 1895. 52:788.)

A popular account of power development at Niagara Falls. Dr. Abbott came away from the works of the Niagara Falls Power Company "with a new sense of awe in the contemplation of the powers of nature, which we are but just beginning to understand and use; with a new sense of admiration for the skill of man, who is just beginning to take possession of the earth and to subdue it; and with a new and larger respect for the energy, enterprise and public spirit of at least some American millionaires."

1895 Cassier's magazine. Niagara power number. July, 1895. 8:173–384.

"A complete story of the great Niagara power enterprise, comprised in ten articles, with nearly two hundred illustrations, including portraits of the officers and directors of the Cataract Construction Company, the members of the International Niagara Falls Commission, and the engineers under whose supervision the work was carried out."

Harnessing of Niagara. (Cassier mag. co. N. Y. & Lond.: 1895.) 1895

A publication in book form of Cassier's power number of July, 1895.

Contents:

Use of the Niagara Water Power. Francis Lynde Stetson.

Mechanical Energy and Industrial Progress. Prof. W. Cawthorne Unwin.

Some Details of the Niagara Tunnel. Albert H. Porter.

Construction of the Niagara Tunnel, Wheelpit and Canal. George H. Burbank.

Niagara Mill Sites, Water Connections and Turbines. Clemens Herschel.

Electric Power Generation at Niagara. Lewis Bulkley Stillwell.

The Industrial Village of Echota at Niagara. John Bogart.

Notable European Water Power Installations. Colonel Thomas Turrettini.

Distribution of the Electric Energy from Niagara Falls. S. Dana Greene.

The Niagara Region in History. Peter A. Porter.

DUNLAP, ORRIN E. (The) Niagara Falls Hydraulic Power and Manufacturing Company's new work. (Elec. eng., Dec. 4, 1895. 20:537–39.) 1895 Dunlap

A brief description of the new station and its machinery.

Electrical Niagara. (Power. Feb., 1895. 15:12.) 1895

Photographs and description of the actual condition of the power work at Niagara.

FORBES, GEORGE. Harnessing Niagara. (Blackwood, Sept., 1895. Pp. 434–444.) 1895 Forbes

A collection of personal experiences, and information concerning the problems met at Niagara.

GREENE, S. DANA. Distribution of the electrical energy from Niagara Falls. (Cass., July, 1895. 8:333–362.) 1895 Greene

The author states that it is the purpose of his article "to point out some of the applications to which the electric energy generated at the Falls has already been put, and to discuss other applications which suggest themselves as probabilities." The article deals with the transmission and use of electric motive power, and discusses the advantage of electrically transmitted water power over steam power furnished by fuel.

1895 Herschel

HERSCHEL, CLEMENS. Niagara mill sites, water connections and turbines. (Cass., July, 1895. 8:227–250.)

This is another article in Cassier's "Niagara Power Number."

One of the present series of articles must evidently treat of the power producing plant, and its installation,— two essential elements in the series of mechanisms that convert the flow of the Niagara river over the Falls, into other forms of energy,— finally represented by a revolving shaft in the factory, by the speeding car in the street, or by other of its manifold forms of utility. It is this part of the description of the manner of utilizing Niagara Falls that is to fall to the lot of the present article.

The standard American method of utilizing a large amount of water-power, has hitherto been, to distribute the water to the several consumers, or mill-owners, by means of a system of head-races, so-called, with facilities for its discharge at a lower level, to be utilized as the owner or lessee saw fit, and generally on his own premises. This led to long head-canals, and to insignificant tail-races, whereas, as we shall presently see, the Niagara plant consists of a common tail-race, a mile and a half long, with comparatively insignificant head-races. The old-time water-power company sold or leased the right to draw a definite quantity of water, at defined times, with the privilege of discharging it at a lower level, and the mill-owner did the rest; whereas, at Niagara Falls, the right is leased to discharge a definite quantity of water into the tail-race tunnel, with the privilege of drawing this quantity from the head-canal, or from the river. But over and above this the product,— power,— may be contracted for at Niagara Falls, delivered on the shaft.

To create a large group of mill-sites of the older sort, there was necessary, in the first instance, a large continuous body of land, properly located for the purpose. If this could not be bought up secretly, and in large blocks, the whole water-power enterprise would fail to come to fruition. In Europe, however, several such enterprises came into being in spite of the inability of the projectors to primarily buy tracts of land such as have been described. This was done by establishing central power

stations near the dam, or head canal, and then transmitting the power produced, instead of water to produce it, to the consumers, or mill-owners. Up to within say five years, this had always been accomplished by means of wire-rope transmissions of power, and it is easy to see that the invention of the electrical transmission of power would give this form of the utilization of a large water-power a great impetus. Many such plants are, therefore, already in existence, many are building, but among them all, no one is probably so celebrated, and is attracting the attention of all intelligent men as this at Niagara Falls. 1895 Herschel

The work at Niagara is designed to be utilized in both of the methods above described, and examples of both methods of distributing power are built. The plant of the Niagara Falls Paper Company is an example of the first and older method of power utilization, while the Central Power Station of the Niagara Falls Power Company is the grandest example yet undertaken of the second described, and the later method of power distribution. The Niagara Falls Power Company also owns some 1200 acres of land adjoining the Central Power Station and the present head canal, all of which can be utilized for the sites of manufacturing establishments by one or the other of the methods described. This has been laid out in streets and blocks, with a freight railroad, to be spoken of presently, connecting the mill sites with all the trunk lines that pass Niagara Falls, and adjoins the residential district being developed by the Niagara Development Company, whose first fruits are the village called Echota, and the adjoining wharf and other property. But over and beyond all this, a transmission of power to Buffalo, only 20 miles off, and possibly still further, is within the scope and design of the Central Station now building.

. . . . .

One of the neatest and most valuable attributes of the Niagara Falls Power Company's mill sites is the road of the Niagara Junction Railway Company. Niagara Falls is already, or is destined to be, one of the great railroad centres of the United

1895
Herschel

States. Two railroad bridges cross the river there, each used by several East and West trunk lines, and other such bridges are already talked of. Railroad freight rates are in competition with each other, and with lake and canal rates, and are to-day no greater from Niagara Falls to New York and to Boston, than they are from the established manufacturing centres of the East to these cities, while they are, on the other hand, very materially less from Niagara Falls to the great cities of the West, Southwest and South than they are from these same older manufacturing centres. The present favorable conditions will bring more manufacturing into the Buffalo and Niagara Falls district, and, as such things always operate, will also bring in still other trunk lines of railroad.

It is for the purpose of enabling the occupant of any mill-site of the Niagara Falls Power Company to receive cars shipped to him by any line of railroad entering the Buffalo–Niagara Falls district, and of delivering cars directly to any such railroad, that the Niagara Junction Railway Company was organized and the road built. It is an allied enterprise of the Niagara Falls Power Company and will do no little in furthering the growth and business of the new city, benefiting, in turn, all the trunk lines that do now or will, eventually, traverse the Niagara Falls neck of land between Lake Erie and Lake Ontario. Lake transportation, and transportation on the Erie canal are, however, also available to the occupants of these mill-sites. Many of them front directly on the Niagara river, where it is navigable, and none of them are any great distance from it.

It will not be necessary to say much more on the subject of water connections at the Niagara mill-sites. The Niagara Falls Paper Company has a square wheel-pit, which is connected with the main tunnel tail-race by a branch tail-race, 7 feet in diameter. All dimensions of underground work are kept as small as possible at Niagara Falls, to economize rock excavation, as, for example, the branch tail-race just mentioned. Fall being a commodity of less than the usual value on these sites, it is economy

to spend some of it toward reducing cross sections. This pro- 1895
duces high velocities, but the tail-races are built of first-class Herschel
materials, and are set in a rock excavation. The water used carries no sand, and experience has already shown that the tail-races line themselves with a layer of slime in spite of the great velocity in them. So long as this slime adheres to the brick and to the cement joints, there can evidently be no wear of the brick masonry lining.

The wheel-pit of the Niagara Falls Power Company is a long slot cut in the rock, instead of a group of small wheel-pits, and to save excavation, though at the cost of some fall wasted, the wheels are set on plate-girder bridges spanning the slot, and so as to leave a tail-race beneath the plate girders. This tail-race, or bottom of the slot, is connected by a short curve with the main tail-race tunnel.

The fashionable turbine of the present day, in the United States, is, no doubt, the twin turbine, with horizontal axis, this axis projecting from the wheel case, at one or both ends, and either driving its attached machine directly, or carrying a pulley, to belt from. Several attempts were made to fit this general form of motive power for the case in hand.

(The remainder of the article is largely taken up with a very technical discussion of the turbines used at Niagara, and a comparison with turbines used for water power purposes in Euorpe.)

LE SUEUR, ERNEST A. Professor Forbes on " Harnessing Niagara." 1895
(Pop. sci. mo., Dec., 1895. 48198–204.) Le Sueur

A scathing review of Professor Forbes article on "Harnessing Niagara."

Nikola Tesla and the electrical outlook — the new development in power 1895
transmission. (R. of R., Sept., 1895. 12:293–294.)

An account of Tesla's discovery of the " rotating magnetic field."

. . . " The rotating magnetic field," which opened the way to the conversion (by means of alternating, as against the direct current) of electrical into mechanical energy and the economical transmission of power through long distances. This discovery forms the basis of the Niagara Company's attempt to utilize on a large scale Niagara Falls river.

1895 Perkins

PERKINS, FRANK C. The Niagara power transmission plant. (Elec. wld., Feb. 9, 1895. 25:165–167.)

A detailed description of the transmission plant and apparatus.

1895 Pope & Pope

POPE, FRANKLIN LEONARD, *and* POPE, RALPH R. The distribution of electric power at Niagara. (Eng. mag., Dec., 1895. 10:407–417.)

"A summary of some important contributions recently made to the problem of electrical transmission of power with special reference to the case of the Niagara plant."

1895 Porter

PORTER, ALBERT H. Some details of the Niagara tunnel. (Cass., July, 1895. 8:203–210.)

"Mr. Porter was the resident engineer for the Cataract Construction Company until the completion of the tunnel and the preliminary work was done under his immediate supervision."

This article describes how the surface alignment for the tunnel was obtained, how the alignment and grade of the tunnel were maintained, the system of blasting used, the solution of the drainage difficulties, the timbering and lining of the tunnel.

1895

Power plant of the Niagara Falls Hydraulic Power and Manufacturing Company. (Power, Dec. 17, 1895. 15:17.)

This description of the lower plant and equipment of the Hydraulic Power and Manufacturing Company is taken from the Canadian Journal of Commerce.

1895 Stetson

STETSON, FRANCIS LYNDE. The use of the Niagara water power. (Cass., July, 1895. 8:173–192.)

To most, the first impression, and to many the enduring impression, is that of awe, in which the subjective mood prevails and a certain sense of personal danger dominates all other thoughts of this mighty moving flood, pouring resistlessly down through the gorge. . . . Danger there certainly is, and death in this resistless, remorseless tide has been found and also has been sought by hundreds; but notwithstanding its appalling aspect, it is through this very sense of resistless power that the Falls speak to minds of great dignity and self-restraint, and lead them to observe as did Mr. Carter of New York, in his characteristically fine oration at the opening of Niagara Park, that the "sense which responds to this magnificent motion" is the "sense of power."

1895
Stetson

And why should it not be so? Nearly 6000 cubic miles of water, pouring down from the upper lakes with 90,000 square miles of reservoir area, reach this gorge of the Niagara river at a point where its extreme width of one mile is by islands reduced to two channels of only 3,800 feet. Here, in less than half a mile of rapids, the Niagara river falls 55 feet, and then, with a depth of about 20 feet at the crest of the Horse Shoe Falls, plunges 165 feet more into the lower river. The ordinary flow has been found to be about 275,000 cubic feet per second, and in its daily force, equal to the latent power of all the coal mined in the world each day — something more than 200,000 tons.

This natural comparison at once suggests, as through the century it has invited, an estimate of this power in the terms of mechanics, and it has been computed by Professor Unwin that these falls represent theoretically seven million horse-power (others think more), and for practical use, without appreciable diminution of the natural beauty, several hundreds of thousands of horse-power. The idea of subjecting to industrial uses some part of the enormous power of Niagara Falls has, since the location of the pioneer saw-mill in 1725, occupied the minds and stirred the inventive faculty of engineers, mechanics and manufacturers. Early in the century, the pioneers in the locality, to which they then gave the name of Manchester, contemplated the probability, but were unable to demonstrate the practicability, of reducing this mighty force to obedient and useful service. They dwelt upon, and to some extent exploited, the idea; but before the development or adoption of any method promising satisfactory returns, steam and steam engines had properly attained such a place in the favorable estimation of manufacturers that water-powers in general, and especially those inconveniently situated and variable in quantity and quality, fell in comparative disesteem.

. . . . .

No one needs much persuasion to admit that, except for the decided merits of water-power even in competition with steam,

1895
Stetson

the names of Manchester, Lowell, Lawrence, Holyoke, Paterson, Cohoes and Minneapolis, in the United States, would possess nothing like their present significance.

In view of the obvious advantages offered by water-powers such as these, Augustus Porter, one of the principal proprietors at Niagara, in 1842 proposed a considerable extension of the system of canals or races then employed, and in January, 1847, in connection with Peter Emslie, a civil engineer, he published a formal plan, which became the subject of negotiations with Walter Bryant and Caleb S. Woodhull, formerly Mayor of New York. An agreement was finally reached with these gentlemen by which they were to construct a canal, for which they were to receive a right of way, 100 feet in width, together with a certain amount of land at its terminus. After various interruptions, in 1861, their successor, Horace H. Day, completed a canal, about 35 feet in width, 8 feet in depth, and 4400 feet in length, by which the water of the upper Niagara river was brought to a basin or reservoir at the high bluff of the lower river, 214 feet above the water below. Upon the margin of this basin have been constructed various mills, to whose wheels the water was conducted from the canal and discharged by short tunnels through the bluff into the river below, so that in 1885, about 10,000 horse-power, substantially the available capacity of the canal, was in use.

In that year there happened to be at Niagara an able and experienced engineer, engaged in the State's service in laying out a proposed reservation, just as nearly fifty years before he had been there engaged in assisting the State Geological Survey of Prof. James Hall, who, in his report on the Niagara river district for 1843, specially mentions the services of Thomas Evershed. During this very long interval. Mr. Evershed had been engaged as a public engineer, usually upon the Erie canal in that vicinity, and it was natural that he should be called upon to devise a system for the development of hydraulic power from the river with which his whole professional career had been associated, his last great work being in connection with the effort to protect

Niagara, in its principal character as the most magnificent and impressive terrestrial natural object, from vandalism and utilitarian desecration. This protection of the natural beauty of Niagara was the underlying idea in his conception and development of his plan, which contemplated the taking of water and the development of power in a district more than a mile above, and out of sight of the Falls, with an outlet tunnel discharging inconspicuously at the river's edge below the Falls, involving the diversion of less than four per cent of the total flow of the river, and a reduction of the depth of the water at the crest of the Falls by less than two inches. 1895 Stetson

After conference with Mr. Evershed, Capt. Charles B. Gaskill, the oldest user of power on the hydraulic canal, with seven other gentlemen of Niagara Falls, obtained from the Legislature of the State of New York, a special charter, passed March 31, 1886, which has since been amended and enlarged by several successive acts. Upon July 1, 1886, Mr. Evershed issued his first formal plan and estimate, which was considered worthy of discussion in Appleton's Cyclopaedia for 1887, where it is described in general terms. But, of course, the publication of this plan invited and encountered the demonstration of its absolute impracticability, as well as the improbability of the use of the power if developed.

. . . . .

For three years the originators of the Niagara water-power project were engaged in convincing capitalists that it would be commercially profitable to undertake and complete the development of Mr. Evershed's plan, and the first step necessary to be taken was to demonstrate the advantage of the locality. It was shown that the capacity of the original tunnel, about 120,000 horse-power, would exceed the combined theoretical horse-power of Lawrence, Lowell, Holyoke, Turners Falls, Manchester, Windsor Locks, Bellows Falls and Cohoes, and would very largely exceed the actual developed power of all these places, and Augusta, Paterson and Minneapolis in addition. Considering the further right to construct an additional tunnel of 100,000

1895
Stetson

horse-power on the American side, and to develop at least 250,000 horse-power on the Canadian side, it was readily recognized how vastly this local development promised, in extent, to surpass the combined water-powers of almost any American State or section.

. . . . . .

The question of the practical importance of the Niagara power being settled, Mr. Atkinson's next question arose as to the advantages of Niagara as a locality, and to this, answer was readily made by pointing out that there in the very heart of densest population, touched by nearly all the East and West trunk-lines, within a night's journey of Boston, New York, Philadelphia, Washington, Pittsburgh, Cincinnati, Cleveland, Chicago, Toronto and Montreal, was a natural port of the great lakes, sustained by a salubrious and fruitful country and protected by the orderly and established institutions and traditions of the most opulent and populous of the states of the Union. The existence of manufacturing establishments sufficient to exhaust all of the power then supplied by the hydraulic canal, and the subsequent applications for the new power, were and are the complete answer to the question whether, as a locality, Niagara would be attractive to users of power.

But the question still remained whether water-power could be used successfully in competition with steam, and there are few places in respect of which this question can be asked with more deadly effect; for, in the city of Buffalo, and indeed through the entire length of the district lying north of Pittsburgh, good steaming coal can be obtained at less than $1.50 a ton. With coal at this price, it would, at first, seem impracticable to establish any power plant capable of operating in competition with steam. But a careful examination has satisfied me, at least, that with coal furnished free at the furnace yard, it would still be economical for the manufacturer to employ water-power such as that at Niagara.

(The remainder of the article describes the establishment of the Cataract Construction Company, the formation and purposes of the International

Niagara Commission, and the electrical and mechanical problems encountered in the transmission of Niagara power.) 1895 Stetson

THOMSON, SYLVANUS P. Utilizing Niagara. (Sat. rev., Aug. 3, 1895. 134–135.) 1895 Thomson

A sketch of pioneer work in electrical transmission, the power machinery, and the uses and price of Niagara power.

UNWIN, W. CAWTHORNE. . . . Mechanical energy and industrial progress. (Cass., July, 1895. 8:195–200.) 1895 Unwin

The author is "one of the best known engineers, authors and teachers of engineering science in England, as well as in America. He was a member of the International Niagara Falls Commission."

"Writing however on the European side of the Atlantic, it will be wisest,— not to say most modest,— to avoid details and to deal, in preference, with some general considerations bearing on the question of utilizing and distributing power."

So the author says and so he does. The article is a very brief account of the cost of power as an item in the cost of production, and the economic advantage of water power over steam. According to Professor Unwin, "in the best steam engines the limit of possible economy has been nearly reached. . . . Nor is there much hope of considerable economy from the improvement of other heat engines. Short of going to Iceland, there is only one widely distributed, easily utilizable source of mechanical energy, and that is water power."

BURBANK, GEORGE B. The construction of the Niagara tunnel, wheel pit and canal. (Cass., July, 1895. 8:213–224.) 1895 Burbank

A detailed description of the masonry lining of the tunnel, wheel pit, and canal by the resident consulting engineer and later chief engineer of the construction company.

1896

COE, BEN F. Evolution of Niagara power. (Coll. w., May 28, 1896. Pp. 11–12.) 1896 Coe

Sketches of the Niagara Falls Hydraulic Power and Manufacturing Company and the Niagara Falls Power Company developments, and of some of the concerns using the power.

DUMAS, A. L'utilisation des chutes du Niagara pour la production de l'energieelectrique. (Le Genre civil. Feb. 8, 1896. 28:225–228.) 1896 Dumas

1896 Dumas — Gives the general plan of the Niagara Falls Power Company, describes the system of distribution, the general electric installation, tells how the power developed is used near the Falls and at a distance.

1896 Dunlap — DUNLAP, ORRIN E. Calcic carbide plant at Niagara Falls. (W. elec., Jan. 18, 1896. 18:28–29.)

This is a description of the first plant of its kind in America. Its product is used for the manufacture of acetylene gas.

"One important feature of this plant is that an alternating current furnace is to be used, whereas all the other electric manufacturing plants at Niagara Falls use direct current."

DUNLAP, ORRIN E. Conveying the roar of Niagara by telephone to New York. (W. elec., May 30, 1896. 18:265.)

A brief statement of the process by which the roar of Niagara Falls was transmitted to an electrical exposition in New York by telephone.

DUNLAP, ORRIN E. Electric power transmission at Niagara. (W. elec., Feb. 8, 1896. 18:61–62.)

An excellent popular account of the rapid progress in power development.

DUNLAP, ORRIN E. The manufacture of carborundum. (Elec. power, Jan., 1896. 9:1–5.)

An interesting nontechnical description of the process of making carborundum in electric furnaces with Niagara power.

DUNLAP, ORRIN E. The manufacture of chemicals by Niagara power. (Elec. eng., Sept. 9, 1896. 22:248–249.)

A description of the plant and processes of the Chemical Construction Company.

DUNLAP, ORRIN E. More power at Niagara Falls. (W. elec., March 21, 1896. 18:133–134.)

Written at the time of the erection of the third 5,000 horse-power generator in the central station of the Niagara Falls Power Company.

DUNLAP, ORRIN E. New power development at Niagara Falls. (Cass., March, 1896. 9:484–487.)

Description of the installation of the new plant of the Niagara Falls Hydraulic Power and Manufacturing Company.

DUNLAP, ORRIN E. Niagara model for the electric exposition. (W. elec., April 18, 1896. 18:181–182.) 1896 Dunlap

A description of the model made for the electric exposition at New York of the upper Niagara, the city, the gorge, the Canadian shore, and the Niagara Power Company plant.

DUNLAP, ORRIN E. Nikola Tesla at Niagara Falls. (W. elec., Aug. 1, 1896. 19:55.)

An account of Tesla's first visit to the plant of the Niagara Falls Power Company and his impressions.

DUNLAP, ORRIN E. Old hydraulic canal plant at Niagara Falls transformed for electric transmission. (W. elec., Dec. 5, 1896. 19: 273–274.)

An account of the changes and improvements made in the canal property by the Niagara Falls Hydraulic Power and Manufacturing Company, especially during the construction of its new plant at the water's edge.

DUNLAP, ORRIN E. One year of electric power transmission at Niagara Falls. (W. elec., April 4, 1896. 18:163.)

A review of the achievements of the first year.

DUNLAP, ORRIN E. Transmission of Niagara power to Buffalo. (Elec. eng., Oct. 28, 1896. 22:413–415.)

A description of the construction of this important transmission line.

The gorge road at Niagara. (Sci. Am., March 28, 1896. 74: 193–199.) 1896

Account of this road being run by Niagara power from the Niagara Falls Hydraulic Power and Manufacturing Company.

MARTIN, THOMAS COMMERFORD. Niagara on tap. (Jour., Frank. inst. Oct. & Nov., 1896. 142:287–302 and 354–366.) 1896 Martin

A lecture delivered before the institute January 3, 1896.

MARTIN, THOMAS COMMERFORD. The utilization of Niagara. (Printed in Proc. of Royal Inst. of Gr. Br. 15:269–279.)

"Read at extra evening meeting of Royal Institution of Great Britain, June 19, 1896." From the extract quoted below are omitted some of the purely technical descriptions.

1896
Martin

The broad idea of the utilisation of Niagara is by no means new, for even as early as 1725, while the thick woods of pine and oak were still haunted by the stealthy redskin, a miniature saw-mill was set up amid the roaring water. The first systematic effort to harness Niagara was not made until nearly one hundred and fifty years later, when the present hydraulic canal was dug and the mills were set up which disfigure the banks just below the stately falls. It was long obvious that even an enormous extension of this surface canal system would not answer for the proper utilisation of the illimitable energy contained in a vast stream of such lofty fall as that of Niagara.

Niagara is the point at which are discharged, through two narrowing precipitous channels only 3,800 feet wide and 160 feet high, the contents of 6,000 cubic miles of water, with a reservoir area of 90,000 square miles draining 300,000 square miles of territory. The ordinary overspill of this Atlantic set on edge has been determined to be equal to about 275,000 cubic feet per second, and the quantity passing is estimated as high as 100,000,000 tons of water per hour.

. . . Between Lake Erie and Lake Ontario there is a total difference of level of 300 feet (fig. 1,), and the amount of power represented by the water at the falls has been estimated on different bases from 6,750,000, horsepower up to not less than 16,800,000 horsepower, the latter being a rough calculation of Sir William Siemens, who, in 1877, was the first to suggest the use of electricity as the modern and feasible agent of converting into useful power some of this majestic but squandered energy.

It may be noted that the water passing out at Niagara is wonderfully pure and "soft," contrasting strongly, therefore, with the other body of water, turbid and gritty that flows from the north out through the banks of the Mississippi. The annual recession of the American Fall, of 7½ inches, and of the Horseshoe, of 2.18 feet, would probably have been much greater had the water been less limpid.

. . . . .

It was Mr. Thomas Evershed, an American civil engineer, who unfolded the plan of diverting part of the stream at a considerable distance above the falls, so that no natural beauty would be interfered with, while an enormous amount of power would be obtained with a very slight reduction in the volume of the stream at the crest of the falls. . . . 1896 Martin

The time honored plan in water-power utilisation has been to string factories along a canal of considerable length, with but a short tail race. At Niagara the plan now brought under notice is that of a short canal with a very long tail race. The use of electricity for distributing the power allows the factories to be placed away from the canal, and in any location that may appear specially desirable or advantageous.

The perfected and concentrated Evershed scheme comprises a short surface canal 250 feet wide at its mouth, 1¼ miles above the falls, far beyond the outlying Three Sisters Islands, with an intake inclined obliquely to the Niagara River. This canal extends inwardly 1,700 feet, and has an average depth of some 12 feet, thus holding water adequate to the development of about 100,000 horse-power. The mouth of the canal is 600 feet from the shore line proper, and considerable work was necessary in its protection and excavation. The bed is now of clay, and the side walls are of solid masonry 17 feet high, 8 feet at the base, and 3 feet at the top. The northeastern side of the canal is occupied by a power house, and is pierced by ten inlets guarded by sentinel gates, each being the separate entrance to a wheel pit in the power house, where the water is used and the power is secured. The water as quickly as used is carried off by a tunnel to the Niagara River again.

The massive canal power house is a handsome building, designed by Stanford White, and likely to stand until Niagara, spendthrift fashion, has consumed its way backward, through its own crumbling strata of shale and limestone, to the base of it. This building is outwardly of hard limestone and inwardly of enamel brick and ordinary brick coated with white enamel paint.

1896
Martin

It is 200 feet in length at present, and has a 50-ton Seilers electric traveling crane for the placing of machinery and the handling of any parts that need repair.

. . . . .

It is a curious fact that the proposal to transmit the energy of Niagara long distance over wire should have been regarded with so much doubt and scepticism, and that the courageous backers of the enterprise should have needed time to demonstrate that they were neither knaves nor fools, but simply brave, far-seeing men. . . .

We must not overlook some of the fantastic schemes proposed for transmitting the power of Niagara before electricity was adopted. One of them was to hitch the turbines to a big steel shaft running through New York State from east to west, so that where the shaft passed a town or factory all you had to do was to hitch on a belt or some gear wheels, and thus take off all the power wanted. Not much less expensive was the plan to have a big tube from New York to Chicago, with Niagara Falls at the center, and with the Niagara turbines hitched to a monster air compressor, which should compress the air under 250 pounds pressure to the square inch in the tube.

So far as actual electrical long-distance transmission from Niagara is concerned, it can only be said to be in the embryonic stage, for the sole reason that for nearly a year past the Power Company has been unable to get into Buffalo, and that not until last year was it able to arrive at acceptable conditions, satisfactory to itself and to the city. Work is now being pushed, and by June, 1897, power from the Falls will, by contract with the city be in regular delivery to the local consumption circuits at Buffalo. Recent official investigations have shown that steam power in large bulk costs today in Buffalo £10 per year per horsepower and upward. Evidently Niagara power, starting at £2 on the turbine shaft or say less than £4 on the line, has a good margin for effective competition with steam in Buffalo. . . .

What this enterprise at Niagara aims to do is not to monopolise

the power but to distribute it, and it makes Niagara, more than it ever was before, common property. After all is said and done, very few people ever see the falls, and then only for a chance holiday once in a lifetime; but now the useful energy of the cataract is made cheaply and immediately available every day in the year to hundreds and thousands, even millions of people, in an endless variety of ways. 1896 Martin

We must not omit from our survey the Erie Canal, in the revival and greater utilisation of which as an important highway of commerce Niagara power is expected to play no mean part. In competition with the steam railway, canals have suffered greatly the last fifty years. In the United States, out of 4,468 miles of canal built at a cost of £40,000,000 about one-half has been abandoned and not much of the rest pays expenses. Yet the canals have enormous carrying capacity, and a single boat will hold as much as twenty freight cars. The New York State authorities have agreed to conditions by which Niagara energy can be used to propel the canal boats at the rate of £4 per horsepower year. Where steamboat haulage for 242 tons of freight now costs about 6½d. a boat mile, it is estimated that electric haulage will cost not to exceed 5¼d., while with the energy from Niagara at only £4 per horsepower per year it will cost much less. Some two years ago the first attempt was made in the United States on the Erie Canal with the canal boat "F. W. Hawley," when the trolley system was used with the motor on the boat as it is on an electric car, driving the propellor as if it were the car wheels. Another plan is that of hauling the boat from the towpath, and that is what is now being done with the electric system of Mr. Richard Lamb on the Erie canal at Tonawanda, near Niagara. Imagine an elevator shaft working lengthwise instead of vertically. There is placed on poles a heavy fixed cable on which the motor truck rests, and a lighter traction cable is also strung that is taken up and paid out by a sheave as the motor propels itself along and pulls the canal boat to which it is attached. If the boats come from opposite directions they simply

1896 Martin

exchange motors, just as they might mules or locomotives, and go on without delay. . . .

The American company has also preempted the great utilisation of the Canadian share of Niagara's energy. The plan for this work proposes the erection of two power houses of a total ultimate capacity of 125,000 horsepower. Each power house is fed by its own canal and is therefore an independent unit. Owing to the better lay of the land, the tunnels carrying off the water discharged from the turbines on the Canadian side will have lengths respectively of only 300 and 800 feet, thus avoiding the extreme length and cost unavoidable on the American side. With both the Canadian and American plants fully developed, no less than 350,000 horsepower will be available. The stationary engines now in use in New York State represent only 500,000 horsepower. Yet the 350,000 horsepower are but one twentieth of the 7,000,000 horsepower which Professor Unwin has estimated the falls to represent theoretically. If the 350,000 horsepower were estimated at £4 per year per horsepower, and should replace the same amount of steam power at £10 the annual saving for power in New York State alone would be more than £2,000,000 per year.

MARTIN, THOMAS COMMERFORD. The utilization of Niagara. (Ann. rep'ts Smith. inst. 1896. 51:pt. 1, 223–232.)

1896 The new water power development below Niagara Falls. (Eng. news, Mar. 26, 1896. 35:201.)

A description of the new plant of the Niagara Falls Hydraulic Power and Manufacturing Company.

1896 Niagara Falls hydraulic power plant. (Sci. Am., April 4, 1896. 74:215.)

Description of the turbine water wheels.

1896 Power interests at Niagara Falls. (W. elec., Mar. 14, 1896. 18:127.)

Editorial on proposed legislation in favor of the power companies and regarding power transmission from Canada.

REPLOGLE, MARK A. Electricity and water power and their inter-relations; a popular treatise. N. Y.: Elec. Rev. Pub. Co. 1896. Pp. 132–146. 1896 Replogle

The whole book is written in popular style and contains one chapter on "The Greatest of Electric Water Power Propositions, Niagara Falls."

RICHARDSON, ALEX. Niagara Falls and water-power. Good words, (Lond.) Mar., 1896. Pp. 183–189.) 1896 Richardson

A brief description of the Niagara works. There is much digression about the small power developments in various parts of Great Britain.

Trolley to cross Niagara. (St. ry. rev., Feb. 15, 1896. 6:109.) 1896

The writer of this article believes this railroad project to be the "most marked effect yet seen of the electric development at Niagara."

TUTTLE, W. E. Electricity at Niagara Falls. (Elec. wld., Mar. 7, 1896. 27:256.) 1896 Tuttle

A description of a new plant under construction by the Niagara Falls Hydraulic Power and Manufacturing Company which it was thought would produce the cheapest power for the money invested of any plant in this country.

WOOD, DE VOLSON. A turbine of the Niagara power company. (Am. mach., Jan. 23, 1896. 19:106–107.) 1896 Wood

The possibilities of a large turbine of the Fourneyron type based upon data supplied by Professor Coleman Sellers.

(The) Niagara Falls electric power plant. (Sci. Am., Jan. 25. 1896. 74:55.) 1896

"A description of the power house with its water connections and electric plant. The illustrations show the relation of the surface canal, which takes water from the Niagara River above the falls, to the power house."

Niagara power for the Buffalo railway system. (St. ry. jour., Dec., 1896. 12:772–775.) 1896

A description of the methods by which Niagara power is supplied to the Buffalo railway system.

1897

AUBERT, F. Transport de force par l'électricité des chutes du Niagara á Buffalo. (Le Genre Civil. July 24, 1897. 31:201–202.) 1897 Aubert

Description of the transmission line, the transformers, etc.

1897 Blanchard

BLANCHARD, FRANK LEROY. Niagara power at Buffalo. (Harp. w., June 5, 1897. 41:569–570.)

An account of "how the electric current is brought over the twenty-six miles of wire to Buffalo."

1897 Cazin

CAZIN, F. M. F. Niagara power. (Elec. wld., July 17, 1897. 30:72–74.)

According to the author, the purpose of his paper "is to discuss the features of power absorption from the falling waters as actually practised, and to indicate a line for improved methods and machinery."

1897 Dunlap

DUNLAP, ORRIN E. Additional power facilities at Niagara Falls. (W. elec., Nov. 27, 1897. 21:299–301.)

Account of the enlargement of the existing plants on the American side, and the Canadian projects.

DUNLAP, ORRIN E. The extension of the power plant of the Niagara Falls power company. (Eng. news, Oct. 14, 1897. 38:242.)

The extension of the wheel pit and erection of the new power house described with special reference to new methods employed.

DUNLAP, ORRIN E. Lord Kelvin and the Niagara power transmission. (Elec. eng., Aug. 26, 1897.)

An account of an interview with Lord Kelvin, the president of the International Niagara Commission.

DUNLAP, ORRIN E. Power transmission from Niagara Falls. (Cass., Jan., 1897. 11:197–204.)

An account of the Niagara–Buffalo transmission line. According to Mr. Dunlap, "it is probable that no pole line was ever better constructed than that from Niagara Falls to Buffalo." The article, which is non-technical, descriptive and historical, may also be found in the *Journal of the Western Society of Engineers*, January, 1897, vol. 2, pages 80–84.

1897

(The) Electric features of Niagara. (Elec. wld., June 5, 1897. 29:719–734.)

Contains a number of articles and views on transmission, power and its applications.

1897

(The) Electric railways of the Niagara river region. (St. ry. jour., Oct., 1897. 13:585–611.)

A full account of the way in which Niagara electric railways are using Niagara Falls power.

Electrical development at Niagara Falls. The new wheel-pit. (Elec. rev., April 14, 1897. 30:169–170.) 1897

Account of the Niagara Falls Power Company's extension.

Electricity at Niagara Falls. (Am. elec., June, 1897. 9:211–219.) 1897

"A profusely illustrated article on the present state of the various electrical industries at Niagara.

" The subject of this article is perhaps the most hackneyed in the entire range of periodical literature; indeed, it would be difficult to find a commercial development in any branch of industry which has been more exhaustively described. In what follows therefore, no attempt will be made to give the usual journalistic descriptions, but instead a brief and concise review will be presented of the present situation at Niagara with respect to electrical development, with particular reference to the newest applications and to details of operation."

Electro-chemistry at Niagara Falls. (Pub. opin., July 22, 1897. 23:111.) 1897

An excerpt from an article on this subject by Frederick Overbury in the July number of Cassier's Magazine.

(The) Falls harnessed. (St. ry. jour., Oct. 15, 1897. 7:660–668.) 1897

A historical study of two of the power companies at the Falls.

Fitzgerald, Francis A. The manufacture and development of carborundum at Niagara Falls. (Jour. Frank. inst. Feb. 1897. 143:80–96.) 1897 Fitzgerald

An interesting lecture by the chemical engineer of the carborundum works, delivered before the Franklin institute, December 11, 1896, and dealing with the evolution of the carborundum furnace, the process, and the uses and advantages of carborundum. According to Mr. Fitzgerald the carborundum industry " stands as a conspicuous illustration of the possibilities of the electric furnace as the source of hitherto unknown and valuable products."

Haskin, J. R. The Niagara Falls and Lewiston railway. (Elec. wld., June 5, 1897. 29:725.) 1897 Haskin

An account of the building of the road, the difficulties encountered, the equipment, and the use of Niagara Falls power.

1897 Local distribution of the cataract power at Niagara Falls. (Elec. eng., Feb. 10, 1897. 23:153.)

Contains a map showing the location of factories using the Niagara Falls Power Company's power at Niagara Falls.

1897 New uses for Niagara power. (Elec. eng., June 23, 1897. 23:729.)

Account of power from Niagara used for elevators in Buffalo.

1897 (The) Niagara–Buffalo transmission line. (Elec. rev., June 23, 30, 1897. 30:298–310.)

Read before the National Electric Light Association June 9, 1897, by J. G. White.

1897 (The) Niagara–Buffalo transmission line. (Elec. rev., July 7, 14, 1897. 31:4, 16–17.)

Read before the National Electric Light Association June 9, 1897, by J. G. White. (Concluded from vol. 30, p. 310.)

1897 Niagara Falls hydraulic power and manufacturing company. (Elec. wld., June 5, 1897. 29:730.)

The tremendous impetus that has been given to the operations of this company by the installation of electrical apparatus is worthy of note. For nearly forty years, nothing was done with the gigantic power available at the point where their works are located other than the grinding of flour, and the manufacture of paper by the Cliff Paper Company. Now that electric transmission has added a new means to those at the disposal of engineers this plant has increased greatly in size and is already a formidable competitor to the Niagara Falls Power Company, which operates the hydraulic tunnel.

1897 (The) Niagara Falls power company. (Elec. wld., June 5, 1897. 29:721–723.)

Perhaps no plant has ever been so much and so fully described as that of the Niagara Falls Power Company. The colossal hydraulic developments which were undertaken to supply power for the generation of electric current on a scale hitherto unknown, the enormous machinery which was installed, the serious attempt

to transmit a very great power to a considerable distance, and the discussion by electricians the world over of the problems involved in its construction, have all contributed to make it the most interesting development of the electric arts. 1897

Niagara power. (Elec. rev., July 7, 1897. 31:10.) 1897

A lecture delivered before the National Electric Light Association at Niagara Falls June 9, 1897, by L. B. Stillwell. He calls Niagara "a great solar engine," and deals with the actual and potential types of transmission and its limitations.

Niagara power in Buffalo. (Elec. rev., Dec. 29, 1897. 31:309.) 1897

Two of the largest grain elevators in the world, built in Buffalo, New York, during the summer, at a cost of nearly $1,000,000 are now successfully using vast quantities of the new Niagara Falls power, and within a few weeks, and as soon as the necessary electric machinery can be installed, the wheels and machinery of the Union Drydock, one of the leading shipbuilding plants on the Great Lakes, will also be turned by the Falls current. . . . The Great Northern Elevator receives 1,000 horse-power and the new Electric Elevator 450 horse-power, while the Union Drydock Company will use between 500 and 1,000 horse-power.

Calcium carbide. (Elec. wld., June 5, 1897. 29:733–734.) 1897

A feature of peculiar interest in connection with this process for the manufacture of the so-called rival to the incandescent light is that the calcium carbide, upon which its commercial manufacture largely depends, is the product of the electric furnace, and can only be commercially manufactured by the aid of electricity.

KENNEDY, WILLIAM, JR. Canadian water powers. With special reference to the utilization for electrical purposes. (British assoc. for the advancement of science. Toronto meeting, 1897. Handbook of Canada. Toronto: 1897. Chap. 8, pp. 385–387.) 1897 Kennedy

A brief consideration of the charter and equipment of the Canadian Niagara Power Company projects.

1897 Lord Kelvin's views on Niagara development. (W. elec., Aug. 21, 1897. 21:109.)

Lord Kelvin visited the Falls in August, 1897, and this article is the summary of the views he expressed at that time, as prepared for the Western Electrician by its Niagara correspondent.

1897 Overbury — OVERBURY, FREDERICK. Electro-chemistry at Niagara Falls. (Cass., July, 1897. 12:227–230.)

Has special reference to the Chemical Construction Company, manufacturers of chlorate of potash.

1897 Rankine — RANKINE, WILLIAM B. The accomplished utilization of Niagara. (Elec. eng., Jan. 6, 1897. 23:21.)

Written by the secretary of the Niagara Power Company. It calls for more power and gives a list of contracts for power up to November, 1896, totaling 25,625 horse power.

1897 White — WHITE, J. G. The electric power transmission line between Niagara Falls and Buffalo. (St. ry. jour., July, 1897. 13:425–427.)

A popular account of the construction of this famous power transmission line.

1898

1898 Dunlap — DUNLAP, ORRIN E. Developing power of lower Niagara. (W. elec., June 18, 1898. 22:360.)

Five plans for the development of power at the rapids of the lower river.

1898 Foster — FOSTER, HORATIO A. Niagara power in Buffalo. (W. elec., Jan. 8. 1898. 22:26–27.)

A discussion of the development, distribution, and cost of Niagara power together with other questions.

1898 (A) Great power house at Niagara. (Sci. Am., June 18, 1898. 78:393–394.)

A full and rather technical description of recent power developments at the Falls.

1898 Knight — KNIGHT, S. S. The new twenty-five hundred horse power turbines at Niagara. (Sci. Am., Dec. 10, 1898. 79:373–374.)

A description of the Geyelin–Johval horizontal axis turbines which had just been installed.

1899

(The) Power of Niagara. (Pub. opin., Sept. 7, 1899. 27:303.) **1899**

Editorial comment on figures from the *London Times* showing the amount of power drawn by factories served by the Niagara Falls Power Company.

BIRKINBINE, JOHN. Proposed water-power improvement in the gorge of the Niagara River, New York. (Proc. eng. club, Phila. Jan., 1899. 16:38–45.) **1899** Birkinbine

Outlines of a plan for diverting a portion of the river into a canal to deliver 10,000 cubic feet per second at a moderate velocity for the production of 35,000 horse power.

(The) Birkinbine plan for utilizing Niagara gorge power. (Elec. eng., N. Y. Feb. 9, 1899.) **1899**

(The) Canadian power plant. (Elec. wld., Jan. 14, 1899. 33:47–49.) **1899**

A description of the installation of the plant with views of the machinery. The article states that "on the Canadian side of the river there is but one hydraulic power plant in operation, supplying power to the lines of the Niagara Falls Park and River Railway Company and equipped also with two generators belonging to the Canadian–Niagara Power Company."

HENRY, GEORGES. Utilisation des chutes du Niagara. État actuel des installations hydro-électriques. (Le Genre Civil. June 17, 1899. 35:101–105.) **1899** Henry

Description of the building, the wheel pit, the turbines, lubrication, electrical matters, the capacity and the conclusions to be drawn.

(The) Hydraulic features of Niagara power. (Elec. wld., Jan. 14, 1899.) **1899**

Editorial summary of various plans for the hydraulic equipment.

JOHNSON, WALLACE C. Power development at Niagara Falls other than that of the Niagara Power Company. (Jour. ass'n eng. soc. Aug., 1899. 23:78–90.) **1899** Johnson

A paper read in 1896 and dealing with early power developments.

(The) Power plant of the Niagara Falls hydraulic power and manufacturing company. (Elec. wld., Jan. 14, 1899. 33:43–46.) **1899**

1899 Description of the machinery and system of this plant, which "is laid out on more conservative lines than that of its neighbor up the river, and is certainly subject to far lower fixed charges per kilowatt output."

1899 Rafter

RAFTER, GEORGE W. Water resources of the State of New York. Pt. 2. (Water-supply and irrigation papers of the U. S. Geological survey, No. 25. Wash.: 1899. Pp. 135–143.)

A short discussion of the history of power development at Niagara Falls, with special reference to the Niagara Falls Hydraulic Power and Manufacturing Company and the Niagara Falls Power Company. Illustrated with views and diagrams.

1899 Woodbridge

WOODBRIDGE, J. E. The Niagara Falls power plant. (Elec. wld., Jan. 7, 1899. 33:3–15.)

Gives a full description of the plant,—the superstructure, the wheel pits, the hydraulic passages, the turbines, the oiling system, the governors, the electrical generators, the switchboards, the exciters, the lines, the transformers, and the loads.

No better proof of the success of the original installation from a mechanical and electrical standpoint can be offered than the absence of any important changes in the recent additions. These have been made, as the above description shows, with only detail modifications, not for the purpose of rendering the whole installation uniform but solely because the original general plan was found to be the best one. A consideration of the state of the art at the time the main features of the original plant were settled, namely, 1890 and 1891, will show the remarkable foresight of the members of the original commission. Multiphase work was absolutely unknown in this country; the only alternating-current apparatus consisted of small single-phase belted machines, never run in parallel and never running motors. There were no records of experience from which to draw conclusions as to the relative merits of two-phase or three-phase systems, as to the proper frequency within limits of 10 to 100 cycles per second; there was no available data on the difficulties to be anticipated with high voltages other than that of the Lauffen-Frankfurt test transmission which carried, comparatively speaking, a very small

amount of power and that with considerable trouble. The size of the units adopted was far greater than anything ever before attempted. The type was absolutely new, the peripheral speed was extremely high, the weight of the rotating parts was many times greater than that of any machinery previously built on vertical shafts, and the speed of rotation was high. The daring nature of the undertaking was only equalled by the care with which the best expert advice to be obtained the world over was considered and made use of. One remarkable feature of the plant as a whole is the fact that the changes in the electrical equipment have been, as a rule, far less than those of the hydraulic, and in the two new machines which will soon be contracted for there will be absolutely no changes from the last five, while the new turbines will be subject to several modifications. 1899 Woodbridge

1900

Cheap electricity for all. (Conservation Commission of the State of New York. N. d.) 1900

A tiny pamphlet on the undeveloped hydraulic power in the State of New York, including that at Niagara, pointing out the advantages which would accrue from vesting the water powers of the State in the hands of a commission similar to the Hydro-Electric Commission of Ontario.

G. H. Installation Hydro-électrique des chutes du Niagara. Nouveaux développements. (Le Genre Civil. Mar. 3, 1900. 26:280–302.) 1900 G. H.

Describes the changes in development and in the mode of exploitation.

Niagara Falls industrial number. (Sci. Am. supp., Mar. 3, 1900. 49:20207–20220.) 1900

A number devoted to the history, geology and industries of Niagara Falls.

La nouvelle fosse aux turbines d l'usine hydro-électrique de la Niagara Falls power company à Niagara Falls. (Le Genre Civil. June 16, 1900. 37:123.) 1900

Niagara power. (Cur. lit., Aug., 1900. 29:127–128.) 1900

A brief but lucid article abridged from the *New York Evening Post*, explaining how the use of Niagara power became possible.

1900 Pioneer work at Niagara. (Am. elec., Jan., 1900. 12:38.)

Editorial on new problems presented and solved.

1900 Power of the flood. (Cur. lit., Aug., 1900. 29:127–128.)

An editorial on the utilization of Niagara power and the futility of trying to popularize electrical science.

1900 Woodbridge WOODBRIDGE, J. E. The development and extension of the Niagara power system up to date. (Am. elec., Jan., 1900. 12:1–20.)

An account "replete with valuable illustrations and information on the most advanced developments of polyphase work."

1901

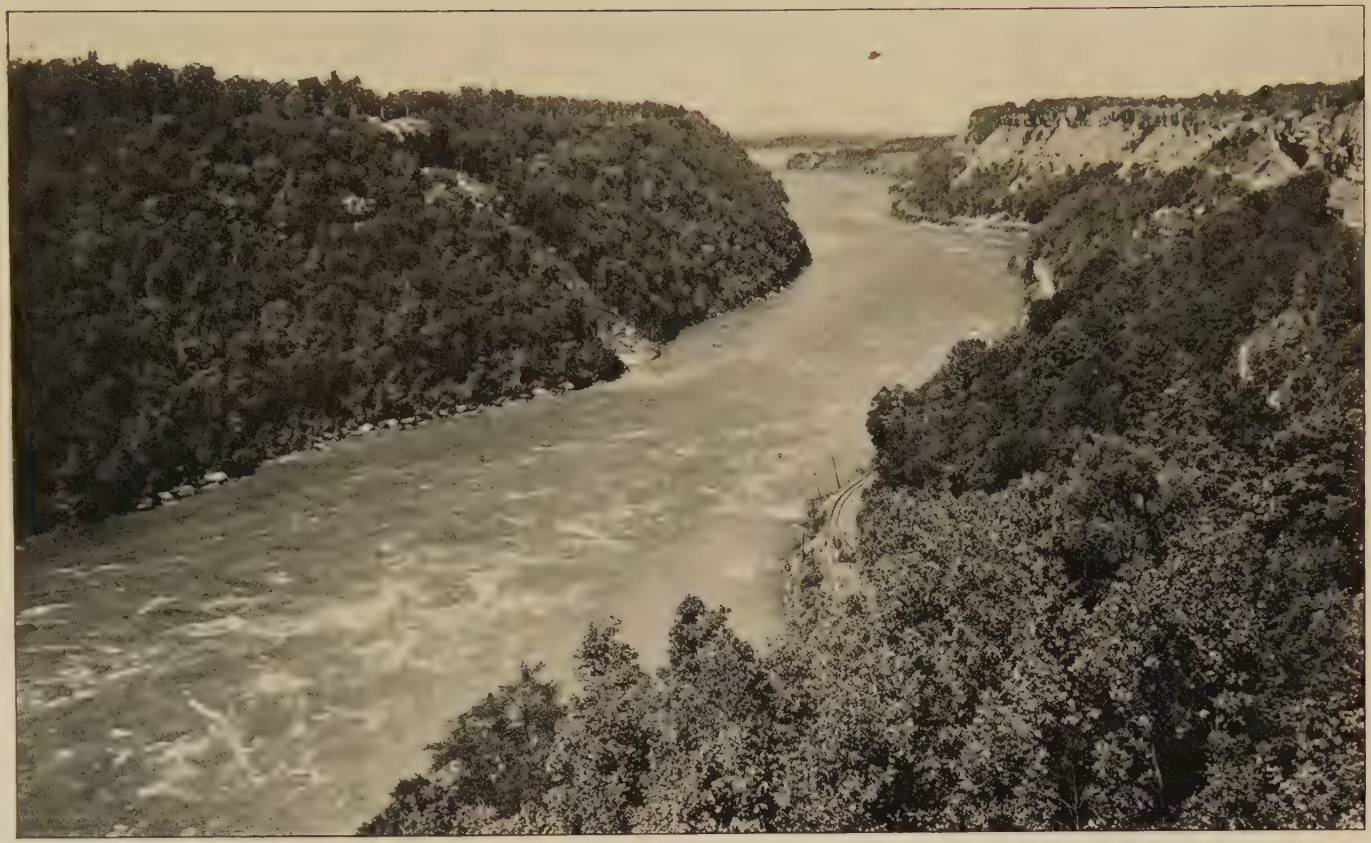
1901 Andrews ANDREWS, WILLIAM C. How Niagara has been "harnessed." (R. of R., June, 1901. 23:694–697.)

A clear and interesting sketch of the history of the Niagara Falls Power Company together with a description of its equipment, the difficulties and problems of power transmission, and the uses of the power developed.

1901 Buck BUCK, HAROLD W. Niagara Falls power. (Cass., May, 1901. 20:3–20.)

In this article Mr. Buck gives the history of power development at Niagara since 1895, the present capacity of the power house of the Niagara Falls Power Company, the classes of service, the various industries supplied, the amount and kind of power used and the probable future lines of development. In a word, the status of power distribution from the power house of the Niagara Falls Power Company in 1901 and the probable lines of development in the future.

Probably more has been wirtten about electric power development at Niagara Falls than about any other power plant in the world, partly because it is the largest electric plant in operation, involving remarkable features of hydraulic and electrical engineering, and partly also because the power is furnished by the most famous waterfall in existence. Few, however, are familiar with the remarkable growth, during the past few years, of the industrial system which receives its supply of energy from the Niagara generators, and it is the purpose of this article to outline the many



Rapids and Gorge below the Falls

uses to which the power has already been applied and the engineering methods by which it has been accomplished. 1901 Buck

In electrical engineering to-day a polyphase alternating-current system is considered the only rational system to install for general power distribution. Ten years ago, however, at the beginnings of the Niagara power enterprise, the application of energy to industrial uses was on a basis quite different from that of to-day, and the only factories which could be considered available as customers for such a power development were those who required on their premises mechanical, and not electrical, power. Consequently, schemes suggested then, which now seem somewhat fantastic, for transmitting power from the Falls by compressed air and various other means, deserved, at that time, more serious consideration. The arts of electric lighting, electric traction, and, above all, electro-chemistry, were only just beginning, and had not assumed the vast proportions of the present time, so that transmission of Niagara power by electrical methods did not have the arguments in its favor that it has now. To-day the large majority of the users of Niagara power are those who require on their premises not mechanical power, but electrical current for lighting, smelting, electrolysis, or traction.

Considering this, it is remarkable that, at that time, in spite of the undeveloped state of electrical engineering and the prejudice existing against the alternating current, the engineers connected with the Niagara enterprise should have had foresight enough to select for the power plant the polyphase system, which stands to-day as modern and meets every requirement of the latest developments in the application of energy to industry. Every user of Niagara power requires his current delivered in some special form, and it is here that the flexibility of the low frequency, polyphase, alternating-current system demonstrates its value.

DUNLAP, ORRIN E. The wonderful story of the chaining of Niagara. (Wld's work, Aug., 1901. 2:1052–1054.) 1901 Dunlap

1901 G. H. La nouvelle fossé aux turbines de la Niagara Falls power company. (Le Genre Civil. May 11, 1901. 39:26.)

Describes the existing installation and the new installation after an account in the Engineering Record.

1901 General Electric Company. Niagara power on the street railways of Buffalo and vicinity. Schenectady: 1901.

The largest utilization of water power for street railway purposes in the world is that of the International Traction Company, of Buffalo, New York. . . .

Practically all this system is now operated by electric power derived from the power plant of the Niagara Falls Power Company.

1901 Hartt HARTT, ROLLIN LYNDE. The new Niagara. (McClure, May, 1901. 17:78–84.

An interesting and graphic account of the significance of Niagara power in industry telling how the Falls made vassals of the producers of the West and turned what had been a market into a factory.

1901 The new power transmission line. (Eng. news, Jan. 17, 1901. 45:51.)

Details in which the second Niagara Falls–Buffalo line differed from the old one.

1901 The new wheelpit of the Niagara Falls power company. (Eng. rec., Feb. 16, 1901. 43:150–151.)

A description of the wheel pit, tunnel and cofferdam.

1901 Niagara River development. (Sci. Am., Oct. 12, 1901. 85–230.)

Preparations for Canadian power development.

1901 Stillwell STILLWELL, LEWIS B. The electric transmission of power from Niagara Falls. (Trans. Am. inst. elec. engrs. Buffalo: Aug. 23, 1901. 17:445–544.)

The problems presented, the system adopted, the apparatus used, the new pole line and the terminal house and its equipment.

1901 Weeks WEEKS, ARTHUR B. Recent developments at the Niagara Falls power plant. (Sci. Am., Apr. 13, 1901. 84–229.)

"A rather technical description of the most important mechanical devices in use at the Niagara Falls power plant," with special reference to the aluminum transmission line by which electric current will be sent to the Pan-American Exposition. **1901** Weeks

1902

BARTON, PHILIP P. Niagara Falls power. (Cass., Jan., 1902. 21:179–205.) **1902** Barton

An interesting article by the superintendent of the operating department, describing the organization of the operating department, the problems and principles involved, and the importance of the work.

BOWMAN, A. A. Power development at Niagara Falls. (Can. eng., Nov., 1902. 9:295–297.) **1902** Bowman

Description of the Niagara Falls Power Company's plant and that of the Canadian–Niagara Power Company.

BUCK, HAROLD W. The new generating plants of the Niagara Falls power company. (Trans. Am. inst. elec. engrs. Great Barrington, Mass.: June 18, 1902. 19:765–780.) **1902** Buck

Account of the generators, exciter plant, and main switchboard of the Canadian plant.

BUCK, HAROLD W. The new generating plants of the Niagara Falls power company. (Eng. news, July 3, 1902. 48:9–11.)

Canadian–Niagara power company's development. (Can. eng., Nov., 1902. 9:290–292.) **1902**

Description of the tunnel, canal, cofferdam, penstocks, wheel pit and power house.

DUNLAP, ORRIN E. The new plant of the Canadian Niagara Falls company. (Sci. Am., Dec. 6, 1902. 87:375–376.) **1902** Dunlap

Description and views.

DUNLAP, ORRIN E. Power development on the Canadian side of Niagara Falls. (Eng. news, Dec. 11, 1902. 48:490–491.)

The work of the Canadian-Niagara Power Company and the development of the Ontario Power Company described.

FAWCETT, WALDEN. The new Niagara. (Am. mf. and ir. wld., Dec. 25, 1902. Pp. 717–720.) **1902** Fawcett

1902 Fawcett That the eyes of the engineering world are now turned upon the " new Niagara " as it has been appropriately designated, is due in great measure to the fact that electric power transmission at Niagara Falls has been the largest and most conspicuous of its kind anywhere and moreover the operations on the Niagara frontier are in every respect typical of those conducted in other sections of the country where water power is abundant.

. . . . .

Considered in the aggregate the power development in the vicinity of the great cataract is impressive in its magnitude. Already the capital invested amounts to $32,500,000, and a number of the projects are yet far from consummation.

1902 Further development of Niagara Falls power. (Sci. Am., Oct. 11, 1902. 87:234.)

Editorial notice of the Canadian–Niagara Power Company's development and of station no. 2 of the Niagara Falls Power Company.

1902 Niagara Falls as an electro-chemical center. (Cur. lit., June, 1902. 32:728–729.)

An abstract of a lecture by Joseph W. Richards giving a brief history of electro-chemical enterprises at the Falls. Taken from the *Age of Steel.*

1903

1903 Brush BRUSH, HARLAN W. Development of Niagara power. (Consular rep'ts. Mar., 1903. Vol. 71, No. 270, pp. 448–450.)

The author, who was United States consul at Niagara Falls, Ontario, takes up especially the Canadian enterprises. He gives evidence to show that the flow is not affected by the power plants.

BRUSH, HARLAN W. Electric power at Niagara. (Sci. Am. supp., Jan. 24, 1903. 55:22633–34.)

A reprint from the United States consular reports.

1903 Buck BUCK, HAROLD W. Recent developments in Niagara power. (Cass., Dec., 1903. 25:104–115.)

An illustrated description of the plants and a list of the customers of the Niagara Falls Power Company by the company's electrical engineer.

Canadian electrical development at Niagara. (Eng. (Lond.), Aug. 7, 1903. 96:136–139.) **1903**

Gives plans and views of the three companies with diagrams of the work.

DUNLAP, ORRIN E. Developments at Niagara Falls for the utilization of its power. (Elec. rev., Sept. 12, 1903. 43:344–349.) **1903** Dunlap

Account of the "progress being made on both sides of the Niagara River." Illustrations of the plants, construction, work and machinery are given.

DUNLAP, ORRIN E. New power house at Niagara Falls. (Sci. Am. supp., June 13, 1903. 55:22941–42.)

Description and illustrations.

DUNLAP, ORRIN E. Prospects of Niagara power on the Canadian side of the Falls. (Sci. Am., Mar. 7, 1903. 88:176.)

A summary of the terms under which the three Canadian companies received their franchises.

FRASER, JOHN FOSTER. America at work. Lond.: Cassell. 1903. Pp. 177–188. **1903** Fraser

A bright and original article in journalistic style giving an interesting account of the development and uses of Niagara power.

Hydraulic features of the plant of the Niagara Falls power company. I. (Eng. rec., Nov. 21, 1903. 48:616–619.) **1903**

General considerations, canal, and intakes.

Hydraulic features of the plant of the Niagara Falls power company. II. (Eng. rec., Nov. 28, 1903. 48:652–655.)

Wheel pits, tunnel, turbine and equipment.

Hydraulic features of the plant of the Niagara Falls power company. III. (Eng. rec., Dec. 5, 1903. 48:691–693.)

Oiling system, governors.

Hydraulic features of the plant of the Niagara Falls power company. IV. (Eng. rec., Dec. 19, 1903. 48:763–767.)

Exciter plant, utilization of power and Canadian turbine.

La nouvelle usine hydro-electrique des chutes du Niagara. (Le Genre Civil. Jan. 3, 1903. 42:149–153.) **1903**

1903 A description of the new installations of the Niagara Falls Power Company and the development of the Canadian–Niagara Power Company with special reference to the turbines and generators. Contains also a detailed diagram.

1903 The new Niagara. (Harp. w., Jan. 3, 1903. 47:pt. 1, 11, 31.)

A discussion of existing and contemplated projects on both sides of the river. According to this author, "the utilization of Niagara below the Falls is in reality something to be discouraged, from the aesthetic standpoint, as it leads to the placing of buildings and plants at some of the most picturesque spots in the gorge. The utilization above the Falls, a mile or two back, offends no one's eye and cannot be detected save by the white foaming tide that shoots out from the portal of the long tunnel just under the first bridge."

1903 Niagara Falls power company's new turbines. (Eng. rec., Oct. 18, 1903. 68:443–644.)

Ten 5,500 horse power waterwheels with 45-inch diameter runners and cylinder gate speed control to replace original installations.

1903 PERKINS, FRANK C. Six Niagara power installations under way — a million horse-power to be developed at Niagara Falls. (Elec. wld. & eng., Apr. 11, 1903. 41:601–604.)
Perkins

Gives the plans, and describes the construction, electric equipment and capacity of the six companies installing new plants and making preparations for installation.

1903 VAN CLEVE, A. HOWELL. Utilization of water power at Niagara Falls. (Bulletin of the Buf. soc. of nat. sci. Vol. 8, No. 1.)
Van Cleve

An address delivered before the Buffalo Society of Natural Sciences, March 13, 1903.

Of all the water power developments that marked the close of the last century none was on so large a scale, none has attracted such world-wide interest, and none is of such importance to citizens of Buffalo and its vicinity as the utilization of the power of Niagara Falls. It is true that the power of this river was used as early as 1725 when the settlers operated a saw mill on the rapids above the Falls, but it was not until after the year 1890 that power development at Niagara assumed more than a local

interest. With the success of electrical generation and transmission there commenced a new phase in the history of industrial Niagara and it is with this later form of power utilization that we are concerned tonight. 1903 Van Cleve

There is of course nothing new in the idea of utilizing Niagara's energy. Every man of a mechanical turn of mind who ever contemplated the resistless force of its falling water has been impressed with the fact that vast industrial progress would result from the diversion of even a small proportion of this power into useful channels. Among those who many years ago felt the mighty power of the falling waters and contemplated the results of using it to produce useful mechanical power was the famous Dr. Siemens, who in a lecture delivered in 1877 before the Iron and Steel Institute of Great Britain referred to his impressions of Niagara and stated that all the coal raised at that time throughout the entire world would be required to produce energy equal to that produced by the falls alone, without considering the force of the rapids. This statement may have been somewhat exaggerated but the following figures are believed to be accurate. The total difference in level of Lakes Erie and Ontario is 328 feet. The minimum flow in the Niagara River, as observed by the government engineers is 178,000 cubic feet per second. The total energy represented by this amount of water in passing from one lake to the other therefore equals 6,635,000 H. P. or in passing from the upper river above the rapids to a point above the lower rapids equals 4,380,000 H. P. But such figures are like those representing the capital of the steel trust, (although this is not entirely a "water" power), or the distance to the nearest fixed star — they convey but little meaning. But take, as an example, the energy produced by a single cubic foot of water per second in dropping from the upper river to a point below the falls, which is 25 H. P. That does not seem a large amount in these days of large numbers, but what does it represent? A force sufficient to raise a one pound weight 2½ miles in one second, to raise a large sized passenger locomotive to the

1903
Van Cleve

height of a man's head in one minute, or to raise an audience of 500 people from the floor to the ceiling of an ordinary room in one minute. And this is done by a bucket of water. Perhaps this may give us some idea of the power that has carved the history of the ages on the rocky walls of Niagara's gorge.

. . . . .

The first company to engage in the development and sale of power on a large scale was the Niagara Falls Hydraulic Power and Manufacturing Co. The plan under which this company is working was outlined by Augustus Porter of Niagara Falls in 1847. Previous to that time a few water wheels had been operated from a canal above the falls and a paper mill had been built on Bath Island, but Mr. Porter sought for some method of development that would not mar the scenic features of the falls and therefore proposed that a canal should be cut from the upper river, just above the rapids, to a point on the top of the high bank of the river below the falls, the water from such canal to be discharged into the lower river after operating wheels set below the level of the ground surface. The almost level surface of the ground between the points of entry and discharge and the substantial character of the rock through which it would pass made the project an ideal one. Nevertheless Mr. Porter failed to interest capital in this project and it was not until after his death that work was commenced. Even then the excavation of the canal was carried on intermittently by various parties until in 1861 Horace H. Day completed a canal 4,400 feet long, 36 feet wide and 8 feet deep. At the lower end of this canal was constructed a basin or forebay, parallel with the face of the cliff and about 350 feet from it, the present size of this basin being 70 feet by 600 feet although it was, of course, much smaller at first. Even then the opportunities of the power do not appear to have been appreciated and it was not until 1870 that the first mill was built to use water from this canal. In 1877 the canal and the property and rights belonging thereto were purchased by Mr.

Jacob F. Schoellkopf and Mr. A. Chesborough who organized the present company. The number of mills utilizing this source of power has steadily increased until at the present time the various industries in the lower milling district (so called) develop about 7,500 H. P. including that in use in the lower mill of the Cliff Paper Co. Most of these factories have constructed their own wheelpits and installed their own wheels. 1903 Van Cleve

A good indication of the progress made in hydraulic development in the last few years is the fact that the original grants of the Hydraulic Power and Manufacturing Co. did not include the slope of the bank between the bottom of the vertical cliff and the edge of the lower river, giving a right to excavate only 100 feet below the top of the bank, as it was considered that wheels would never be constructed to operate under a greater head than this, and it was not until 1886 that the Hydraulic Co. secured deeds for this lower slope. As a matter of fact none of the mills thus far mentioned utilized a head of more than 50 or 60 feet and many of them used a still lower fall. The consequence is that an engineer when looking at the cliff below these mills and seeing the large amount of water falling from the outlets of the various wheelpits is impressed with the vast amount of power going to waste. At least 10,000 H. P. is thus lost, or enough to supply all the industries of many a good sized city.

In 1881 the Niagara Falls Hydraulic Power and Manufacturing Co. installed their first plant for supplying power.

. . . . .

In 1892 the Niagara Falls Hydraulic Power and Manufacturing Co. commenced to enlarge their canal to a width of 70 feet and a depth of 14 feet. In the same year a change was made in the plan of development and a system inaugurated which was in many respects similar to that now employed. The Cliff Paper Mill desired additional power for grinding pulp and as the capacity of the original canal was exhausted and they were not willing to wait for the completion of the canal extension, it

1903
Van Cleve

was determined to use the discharge water from the wheels then installed in the wheelpit above described. Accordingly a new tunnel was driven from the face of the cliff to connect with the bottom of the wheelpit and the discharge water was thus led to a steel penstock 8 feet in diameter laid on the same slope as the talus. In case sufficient water is not discharged from the upper wheels an arrangement is provided for admitting water from the basin directly into the upper tail race . . .

The plant for the Cliff Paper Co. was the fore-runner of the present electrical power plant of the Hydraulic Co. As soon as the company saw that electrical generation and transmission was an assured success and that Niagara Falls was destined to become one of the great electro chemical centers a line of pipe was laid from the basin to the edge of the lower river and water under a head of 210 feet thrown from a giant nozzle or " Monitor " commenced to wash away the rock that for ages had fallen from the bank above to the shores of the gorge below. A level strata near the waters edge was cleared, the fallen boulders were used for masonry and a power house 100 feet wide was built immediately below the old mills, being located a short distance above the upper steel arch bridge.

. . . . .

. . . a figure to be carried away with you tonight is that the wheels now installed by the Hydraulic Power and Manufacturing Co. and its customers have a total capacity of 38,000 H. P., an amount approximately equal to the total power at Holyoke. Very important is the announcement that a new power house with a capacity of 50,000 H. P. is about to be commenced. This power house will contain high voltage dynamos and will be used for supplying new industries in the district just mentioned. Niagara Falls will then contain three great factory districts using an amount of electrical power far exceeding that of any city in the world which employs water as its motive force.

In the year 1885 there came to Niagara Falls in the course of his professional services for the State of New York an engineer whose name should ever be remembered by those interested in the commercial prosperity of the Niagara Frontier, Thomas Evershed, the man with the idea. Engaged in plans to prevent the spoliation of one of the most sublime of nature's spectacles, he saw that such plans were not inconsistent with the utilization of a part of the enormous power represented by Niagara's falling waters. He believed that by driving a tunnel from the lower river to a point above the mouth of the Hydraulic Power Company's canal such tunnel could be used for the discharge of water from the upper river after it had done its work in the generation of power. This idea of a discharge tunnel was not entirely a new one, as it had previously been employed at St. Anthony's Falls on the Mississippi, but the application of this principle to Niagara had apparently never been suggested until it was advocated by Mr. Evershed. Having the courage of his convictions he soon interested local business men in his scheme and a company of eight was formed which on March 31st, 1886, obtained from the State of New York a special charter which permitted the diversion of sufficient water from the upper river to generate 250,000 H. P. On June 1st, 1886, Mr. Evershed issued his first formal plan and estimate to which the attention of capitalists was soon attracted and in 1889 was formed a strong combination of men whose financial reputation was world-wide. They organized the Cataract Construction Co. to build the plant of the Niagara Falls Power Co., the parent Co. The Cataract Construction Co. has now practically gone out of business, the investors who formerly composed it having acquired a controlling interest in The Niagara Power Co. and continuing operations in its name. The plant of this company, especially in its earlier stages, has been so fully described in both the engineering press and in the local papers that its principal features are familiar to you all and it is the intention of the present lecture to call atten-

1903
Van Cleve

1903
Van Cleve

tion to only the more unusual or interesting of its details with such a brief description of its general plans as may be necessary to an understanding of such details.

In the first place consider the main conception,— a tunnel 1¼ miles long, 200 feet beneath the surface, with an area of 335 square feet, designed to carry water at the rate of 29 feet per second, an aqueduct such as was never before built in the history of man — a conception such as could come only to a man with an imagination, an imagination touched by the inspiration of the great cataract within whose sound he had toiled so long. Its immensity may impress us more when we think that when running to its designed capacity such a tunnel will carry enough water in one minute to supply a city of 10,000 inhabitants with drinking water for a year and a quarter.

Mr. Evershed's plan was no sooner formulated than it received severe criticism and eminent men condemned it as impracticable. Fortunately for Buffalo the results have amply proven the incorrectness of such criticism. The faith of the investors was not shaken and the preparation of working plans was immediately begun. In order that such plans might be as perfect as possible an International Niagara Falls Commission was formed June 1890 composed of five noted engineers from America, England, France and Switzerland. Competitive designs for power development were invited, prizes amounting to 22,000 dollars were offered and by January first 1891 22 designs were received from engineers dwelling from Buda Pesth to San Francisco. From these designs that of Faesch & Piccard of Geneva, Switzerland, was considered worthy of first prize and they proceeded with the design of the turbine wheels.

. . . . .

Before the commencement of their operations the Niagara Falls Power Co. and Cataract Construction Co. had purchased tracts of land on which their future tenants could locate, such holdings embracing 1581 acres or 2½ square miles, most of

which is now within the city limits of Niagara Falls. A part of these holdings were taken over by the Niagara Development Co. for a model town and by the Niagara Junction Railway Co. for a terminal railway to transport raw material and finished products to and from the several factories, connections being planned with all trunk railroads entering the city. The Power Company's property has a river frontage of about two miles and the acquisition of lands under water gives dockage facilities for this entire length. A railway dock was built in 1893 and material can thus be transported by water and the Niagara Junction Railway to the doors of any tenant. Ample land and transportation facilities were thus provided by the company for all factories using their power. 1903 Van Cleve

. . . . .

To revert to the history of the plant,— the power furnished was so satisfactory and the demand for such power increased so rapidly that on January 22nd 1897 a contract was let for five additional units of 5000 H. P. and on January 25th, 1899 a further contract was made for two additional units, making a total of 50,000 H. P. As this amount of power still proved insufficient to serve the purpose of local tenants and of the Buffalo load a still further installation became necessary and the important question arose as to where such additional power should be developed. As the tunnel was originally built with a capacity of 100,000 H. P. the water from the future wheels to the extent of 50,000 H. P. would of course be discharged into the tunnel, but the question was whether additional wheels should be placed in an extension of the first wheelpit or in a new wheelpit placed on the opposite side of the canal. After careful consideration, the latter plan was adopted and on November 3rd, 1899, a contract was let to excavate a new wheelpit 468 feet long, 20 feet wide and about 178 feet deep, an extension of the tunnel, 650 feet long, being made to connect such wheelpit with the old tunnel. The plan adopted has many advantages, among them being the opportunity to build a power house which should

1903
Van Cleve

embody the results of the experience gained in operating the first power house, the distribution of current between the two sides of the canal, and the added security against interruption of service. In other words, the eggs would not all be in one basket. . . . This second wheelpit has now been completed and six 5500 H. P. turbines with their shafting and generators are now installed in it. Five additional units are ordered and their installation has now commenced. By next fall such units will be completed and the Niagara Falls Power Co. will thus have a total of 110,000 electrical H. P. for sale.

. . . . . .

Time forbids more than a brief reference to that most interesting problem, the manner in which electric power is transmitted to Buffalo. The current from the generators flows to the switchboard where the controlling devices are situated and thence to the largest transformers ever manufactured where the voltage or intensity, of current is raised from 2200 volts to 22,000 volts. It then passes over bare copper wires through the intermediate towns to the terminal house in this city where the voltage is reduced to 2200 volts for local distribution to the various sub-stations. Three separate and distinct transmission lines of three wires are now in use and if any of these lines is interrupted the current can be transmitted on the other two lines. These lines are daily patrolled and constant watchfulness is exercised to prevent such interruption.

But while power development on the American side has thus been advancing by leaps and bounds, the Canadian shores have not escaped the attention of capitalists anxious to utilize a part of Niagara's energy. The material features of the problem there presented are quite similar to those already described, but the business aspects of the case are somewhat different. The Province of Ontario has set aside for park purposes a large tract lying between the upper Suspension Bridge and the Dufferin Islands and in addition control a strip of land 66 feet wide extending from Lake Erie to Lake Ontario. As the works of any water power plant must necessarily cross under or over, or be situated

upon such park lands it is evident that all Canadian water power development must be subject to the control of the Park Commissioners and in turn to the Ontario Legislature. It was evident, however, that a power house located in Queen Victoria Niagara Falls Park whether on the upper or lower river would be much nearer the falls than would be possible on the American side as the State of New York would permit no power development within the boundaries of its property. Being desirous of securing an opportunity for so favorable a development, a number of American and Canadian capitalists organized the Canadian Niagara Power Co., with the late Albert H. Shaw as President, and on April 7th, 1892 entered into an agreement with the Park Commissioners whereby upon the payment of certain rentals such company was authorized to develop one hundred twenty-five thousand horse power within the park lands in their first power house. This agreement was confirmed by the Ontario Legislature April 8th, 1892 and a charter issued to the company. But in 1892 electrical generation on a large scale was comparatively new and long distance transmission was in its infancy. As a number of the same men were interested in both The Niagara Falls Power Co. and the Canadian Niagara Power Co. they desired to obtain the benefit of the experience to be gained from the American plant before building the costly structure required for their development. Accordingly a new agreement was made with the Park Commissioners July 15th, 1899, and an extension of time secured for the beginning of power development. The plan for utilizing the power is similar in general principles to that of The Niagara Falls Power Co. The power house will be situated at the foot of the slope forming the former river bank and just below the old Carmalite Monastery and south of the Falls View Station. To the power house thus beautifully situated water will be conducted from the rapids by a symmetrically shaped canal spanned by a stone bridge of 5 50 foot arches. The discharge water from the turbines will be conducted to the lower river by a tunnel having the same horse-

1903 Van Cleve

1903
Van Cleve

shoe form as the American tunnel, but four feet greater depth. The most interesting feature of the plant is the size of the units. The original plans contemplated the use of 5000 H. P. machines, but it was found that both the turbine designers and the electrical manufacturers were willing to undertake the building of units of double that size, although nothing of the kind had ever been done successfully. The advantages of the plan are evident as a reduction of nearly 50% is made in the length of the wheel-pit, canal, and power house per given amount of power development. The result of the designers skill will be machines of monstrous size. Imagine if you can, a single machine capable of generating 1⅓ times the entire amount of electricity employed for all purposes at the late lamented Pan-American Exposition. A penstock 10′ 2″ diameter conducts the water to a wheel case 13 feet diameter and 14 feet high, discharging water through two Jonval type turbine wheels with draft tubes, the total head being 136 feet. This monster when fully loaded will use four times the quantity of water in a given length of time that is supplied to the entire city of Buffalo from all its enormous pumps.

. . . . .

The next company to engage in power development on the Canadian side was the Ontario Power Co. in which Buffalo capital is so largely interested. This company entered into an agreement with the Park Commissioners April 11th, 1900, by which they were given rights for two forms of development. The first method was to bring water through an open canal from the Welland River near its junction with the Niagara River to the top of the high bluff west of the park, where a fall of about 50 feet was available upon wheels in a power house located within the Park at the foot of the bluff. The discharge water was to be at first conducted to the upper river but at a later time to flow in a canal to the high bank of the lower river near the Table Rock House, where it would enter penstocks and there be led to wheels in a power house situated in the gorge on the bank of the lower river. The powers of the Ontario Power Co. have

since been increased and its plans have been somewhat changed. A large temporary coffer dam of timber and puddle has been constructed in the upper river near the Dufferin Islands, thus cutting off the flow of water around these islands for the first time in history. While this coffer dam is in place a permanent stone wing dam will be constructed with its top below the surface of the water. The bottom of the river will be dredged and there will be built an entrance forebay with regulating devices from which an underground pipe 18 feet in diameter will be laid to a point just north of the Table Rock House. Provision will be made for three pipes, one of which will supply the first installation. Upon the completion of the head works it is the intention of the Co. to remove the coffer dam and to restore the natural features at the Dufferin Islands to practically their original condition. None of the works of the Ontario Co. will appear above the surface of the ground in the Park proper. . . . Plans still continue for the utilization of power from water to be brought from the Welland River, but these plans will probably not be carried out until the first project is completed. Considerable work has already been done in blasting away the rock for the power house and preparations are completed for active work at the entrance. 1903 Van Cleve

A third company has recently entered the field of power development on the Canadian side. This Company, composed of Toronto capitalists and known as the Toronto and Niagara Falls Power Co., have obtained rights for the development of 125,000 H. P. Their plans are not yet worked out in detail but they include in general a power house on the upper river shore supplied with water from a forebay created by building a wing dam into the upper rapids. The wheels will be situated in a wheelpit and water will be discharged by a tunnel at a point beneath the horse shoe falls.

Power development at Niagara Falls, present and proposed, may be summarized as follows:

1903
Van Cleve

The Hydraulic Power and Manufacturing Co. have 38,000 H. P. developed, are commencing a power house for 50,000 H. P. additional and can make a total development of 125,000 H. P. The Niagara Falls Power Company have 80,000 H. P. ready for service, are installing 25,000 H. P. additional, which will be completed next fall, and have rights for an additional 125,000 H. P. The Ontario Power Company contemplate using 300,000 H. P. and are at work on the installation of 50,000 H. P. The Toronto and Niagara Falls Power Co. have obtained rights for developing 125,000 H. P. and are commencing the installation of 50,000 H. P. The following are the totals; now developed, 118,000 H. P.; in process of development, 225,000 H. P.; rights secured for 1,150,000 H. P. Please remember that the total water power developed in the United States in 1900 was less than 2,000,000 H. P.

Such is the history of water power utilization at Niagara in the past and its condition at present. But what of the future and of the influence of that future on the prosperity of Buffalo? And by Buffalo we mean the greater Buffalo. Must we leave to our real estate friends all the roseate views of Buffalo future greatness? I think not; I believe that as scientific men and women we may look forward with all confidence to a marvelous growth in our city. That water power generating electricity is to be the power of the 20th century needs but little argument. Wood as a source of heat and power need not be considered and it needs no prophet to foresee the time when the coal mines of the U. S. will be exhausted. Long before that time the price of coal will be so high as to prohibit its use for the generation of large blocks of power. You are all aware of the marked increase in the normal, (not strike), prices of soft coal in the last ten years. The exhaustion of the natural gas fields is so rapid that gas is not a factor in the problem. Look which way we may the inevitable conclusion is that recourse by the great factories must be had to the water powers of the country. Of all the hydraulic developments that the 20th century will witness, which

is best situated, which is on the grandest scale, which is most unfailing? Without question that at Niagara Falls. With a reservoir capacity in the Great Lakes of 90,000 square miles, (twice the area of the Empire State), unaffected by the droughts of summer or the freshets of winter, Niagara will stand through the centuries as the emblem of mighty, unfailing, never ceasing power. With this mighty giant delivering the fruits of his labors at her very doors, with unsurpassed railroad facilities, with the iron of Messaba, the copper of Michigan, the grain of Dakota transported by water to her wharves, what city in the world can offer to manufacturing interests such inducements to locate within her boundaries? Buffalo's future greatness rests on no vain product of the imagination but on solid, scientific facts which cannot be belittled or gainsaid, and only the fleeting passage of time brief as the days of a man is needed to make Buffalo the great manufacturing center of the land. . . . The fable of the rainbow has come true and the shimmering bow that ever spans Niagara's gorge holds at either end the hoarded wealth of the ages which will be poured into the lap of the Queen City of the nation.

1903 Van Cleve

WEEKS, ARTHUR B. Canadian power development at Niagara Falls. (Elec. rev., June 6, 1903. 41:961.)

1903 Weeks

The tunnels, wheel pits, forebays, and other construction work of the Canadian companies described.

WHITE, EUGENE R. Niagarics, the new force. (Munsey, Apr., 1903. 29:29–30.)

1903 White

A story of the "remarkable things that have been done by harnessing the vast power of great waterfalls and the still more wonderful things that will probably be accomplished in the near future."

1904

(The) Institution of civil engineers at Niagara Falls, September 27, 1904. Presented by the local committee of the Canadian society of civil engineers. Niagara Falls, Canada.

1904

An illustrated pamphlet descriptive of the American and Canadian power enterprises at Niagara Falls.

1904 (The) Niagara Falls electrical handbook. Being a guide for visitors from abroad attending the international electrical congress, St. Louis, Mo. September, 1904. Published under the auspices of the Am. inst. of elec. engrs. Niagara Falls. 1904.

A well-written little book, profusely illustrated with views and diagrams of the scenic and industrial features of the Niagara region. The first thirty-six pages are given up to an account of the history and geology of the Falls and the various points of interest on both sides of the river. The remainder of the book is devoted to a detailed and scientific account of power development, American and Canadian, and a brief but clear account of each of the various industries using the power in question.

The utilization of the power of Niagara Falls has for years been the dream of engineers and of all those interested in industrial development. In the past many schemes for this purpose have been suggested by engineers and inventors, but never, until the advent of the modern era in electrical engineering, has the proposition, on a large scale, been able to stand upon a basis attractive to the capitalist. The difficulty in the past has not been to apply the waters of Niagara for the turning of a water wheel, for many of the schemes then suggested would have accomplished this successfully; but what to do with the power when thus developed at the water wheel shaft was the problem before the engineer. Obviously here the question of transmission arose as of prime importance.

Among the numerous early plans suggested will be found extensive systems of pneumatic tubes operated by turbine driven air compressors, the air pipes leading therefrom to factories located in the vicinity of a power house, each factory having its own air motors thus operated. It may be of interest to note that one of these early plans contemplated the transmission of power to Buffalo by this means.

Another plan consisted in lines of countershafting bracketed on columns, extending radially from a central power station, this long shafting to be driven by water wheels at the power station through a system of gearing. Factories were to be located along

these lines of shafting and were to receive their power by clutches connected to these shafts. 1904

Still another plan involved the construction of a network of surface canals fed by a common intake from the upper Niagara River. Factories were to be established along these canals and take water from them for the operation of individual turbines; the dead water to be discharged in branch tunnels connected to a main trunk tunnel leading to the lower river.

These plans now look grotesque, but twenty years ago or so they were seriously considered by good engineers. They were discarded largely for financial reasons, the systems showing low efficiency and high cost of construction and maintenance. The final solution of the problem by electrical methods is almost ideal in its simplicity and efficiency as a means of transmitting the energy of Niagara to the consumers.

In the electrical distribution of Niagara power an essential advantage has resulted which was not fully recognized at the time of its first adoption. As the uses of this power have developed it has been found that not only was *power* wanted for industrial purposes but primarily *electric power*. This is especially true in the case of the electrochemical and electric lighting applications. If pneumatic, hydraulic or mechanical power had been supplied for use, it would have been necessary for all the electrochemical plants to convert the power into electric current, before they could use it, with all the loss in power which would result from this conversion. So also with the electric lighting and electric railway applications, where power is wanted in form of electric current.

. . . . .

When the first power house at Niagara Falls was proposed for a capacity of 50,000 horse power, with an ultimate tunnel capacity of 100,000 horse-power, many people wondered how it would be possible to dispose commercially of such a large amount of electric power.

1904 Since that time, however, great developments have taken place in the electrical arts which have made possible the present realization of such a demand for power. The developments which have created this demand have been, first of all, in electro-chemistry, though the output of the Niagara plant is not confined to electro-chemical applications, as is generally supposed. Large blocks of its power are in use for electric railway propulsion, electric lighting, and mechanical power application. One of the recent and important factors in the growth of this power system has been the introduction of the electric motor drive for factory appliances. The evolution of economical methods in power transmission has made the delivery of Niagara power commercially possible to a widely scattered market.

As a result of these developments in the application of electrical energy the first power house has reached the limit of its capacity of 50,000 horse power and the second plant, having a capacity of 55,000 horse power is well along toward its limit.

. . . . .

The Niagara Falls Power Company's distributing system now covers a very large territory; thousands of people are dependent upon it in their daily lives, and commercial interests of great importance are involved in it. The industrial world has learned that the Niagara power enterprise is no longer an experiment, and that it has already become an important factor in the manufacturing status of this continent.

. . . . .

When the Canadian plant is completed the Niagara Falls Power Company and the Canadian Niagara Power Company will have available three large independent power houses for the operation of their system and will be the only power companies having more than one power house for the protection and assurance of continuous supply of power. This is a matter of great importance to customers. In case of some unforeseen accident to any one of the plants, interconnections can at once be estab-

lished so that the most important users of power supplied normally can be supplied with power from the other two without interruption. This is especially important where the public utilities are involved, such as the electric railways and electric lighting companies. As the manufacturing arts advance, the element of power becomes more and more important and cheap power therefore more demanded. Electro-chemistry is a new art, and one which has great possibilities ahead of it. The high temperatures obtainable in electric furnaces have opened up a new field to chemical synthesis, and it is likely that many as yet undiscovered processes which will require large amounts of electrical power for their operation, will be brought to light. The supply of power for electro-chemical purposes is especially desirable in a water power plant where large investment is necessary, for the power used by these processes is practically constant for twenty-four hours of the day, thus tending to reduce load "peaks" on the total station output. 1904

The economical distance to which power can be transmitted extends every year as the general demand for power increases and methods of handling high voltages improve, and the electric equipment of steam railway systems, which is certain to come in time, will open up a further field for the long distance transmission of large amounts of power from a central point.

All these tendencies in industrial conditions, which have been mentioned, result in an accelerating demand for power from Niagara Falls.

Power development of the Toronto and Niagara power company. (Eng. rec., Feb. 13, 1904. 49:180–183.) 1904

A description of the general features and construction methods of this development.

BUCK, HAROLD W. Utilization of Niagara power. (Jour. ass'n eng soc. June, 1904. 32:344–351.) 1904 Buck

An outline of the existing status of the Niagara Falls Power Company's system, describing the plants, and reporting the principal applications of the power generated. The author takes the view that the bulk of the power will be used near Niagara.

1904
Williams

WILLIAMS, ARCHIBALD. The romance of modern engineering. . . . 2d ed. Phila.: Lippincott. Lond.: Pearson. 1904. Pp. 11–33.

A history of power development at Niagara with special reference to the plants on the American side, and a discussion of the uses to which Niagara power is applied.

With power so abundant it may well be cheap. In how many regions of the world would you, for the sum of $8 (£1 12s) obtain from year's end to year's end, without a break, energy representing one horsepower? Having these figures before us we can understand why the Pittsburgh Reduction Company, which controls the aluminum industry of America, left Pittsburgh, where good coal costs but *68 cents* (2s. 10d.) a ton, and migrated to Niagara; and how it comes about that many manufacturers can here save enough on power in one year to pay for building and cost of removal.

. . . . . .

Great factories are springing up for the manufacture of carbide of calcium and other chemicals. . . .

Paper, silver-nitrate, graphite, lamp, cloth, and steel factories are rapidly rising within sound of the Falls. Electricity heats the ovens in the huge establishments of the Natural Food Company. At Tonawanda electricity saws and planes vast sticks of timber; at Lockport it whirls heavy trains; at Buffalo it runs the street cars, prints one of the leading newspapers, handles thousands of tons of cereals, helps in the creation of steel bridges, operates refrigerators, supplies the motive power for great dockyards, tanyards, breweries, and pumps.

(See "The Wonders of Modern Engineering" by the same author.)

1904

(The) works of the Ontario power company. I. (Eng. rec., Oct. 8, 1904. 50:420–422.)

A history of this development and a description of the head works.

(The) works of the Ontario power company. II. (Eng. rec., Oct. 15, 1904. 50:460–462.)

The head works and pipe line.

(The) works of the Ontario power company. III. (Eng. rec., Oct. 22, 1904. 50:480–482.) **1904**

The penstocks, power house and its equipment.

(The) works of the Ontario power company. IV. (Eng. rec., Oct. 29, 1904. 50:504–505.)

A description of construction methods.

1905

ADAMS, ALTON D. Niagara power at Goat Island. (Sci. Am., Apr. 15, 1905. 92:299.) **1905** Adams

The author thinks that "if Niagara Falls is abolished, Goat Island will become the greatest power site in the world."

ADAMS, ALTON D. Pipe line power in Niagara gorge. (Cass., Dec., 1905. 29:126–131.)

According to Mr. Adams, "so much water has already been granted for power purposes above the cataract, that further concessions must be limited mainly to the gorge and lower rapids if the American Falls are to be saved." The author discusses the possibilities and advantages of pipe line power development in the gorge.

ADAMS, ALTON D. Power sites about Niagara Falls. (Sci. Am., Aug. 26, 1905. 93:155.)

A proposal for canals back from the river and a discussion of the advantages of the American side with a notice of existing plants.

ADAMS, ALTON D. Utilizing the power of the Niagara rapids. (Eng. mag., June, 1905. 29:381–387.)

Mr. Adams's paper "proposes a way by which the probably inevitable continuance of the power demands may be fully met with a minimum of loss to the natural beauty of the region."

ADAMS, ALTON D. Wheel pits and tunnels for Niagara power. (Elec. rev.. May 20, 1905. 46:805–809.)

Gives the capacity and cost per horse-power of excavating on the American and Canadian side, and the heads under which the wheels are operated. "On the Canadian side of the Falls a great saving has been effected in the excavation of wheel pits, through the adoption of electric generators of fully twice the individual capacity of those in the plant of the Niagara Falls Power Company."

1905 Canadian–Niagara power to-day. (Elec. wld. and eng., Jan. 7, 1905. 45:17–20.)

Development of the Canadian-Niagara Power Company's plant: its capacity and its connection with the American plant.

1905 Clark. CLARK, GEORGE L. Niagara Falls power, different types of development. (Cass., May, 1905. 28:79–81.)

Nearly every type of water power development known to the art may be seen about Niagara Falls. There we find a deep, vertical shaft or pit near the intake, with water wheels at the bottom, and a long horizontal tunnel for carrying off the tail water to a point in the river gorge below the falls. There, too, is the open surface canal that leads water from the intake to a forebay at the top of the cliff at one side of the cañon, and delivers it to steel penstocks that drop to a power house at the edge of the river below.

In a third case a long steel pipe line takes the place of a canal for leading the water from an intake above the falls to a point at the top of the cliff, whence it drops through steel penstocks to a generating station in the gorge. Still another plan is that by which a power canal, several miles long, draws water from the Welland Ship Canal, expands at several points into large storage reservoirs, and finally terminates at the top of the Niagara escarpment, whence steel penstocks run to a power station near the Lake Ontario level below.

Besides these existing plants, there is the proposal to dig a long open canal from the upper Niagara River, and conduct the water to a point in the gorge below the whirlpool. There is also the plan to excavate a tunnel with its head below the water level in the gorge above the Whirlpool Rapids, and its mouth below the whirlpool, about one and one-half miles down stream, where the power house will be located.

Even the underground type of electric water-power station is to have an example at Niagara Falls, if the proposal of one engineer should materialize. This is to sink a vertical shaft near the upper river to a depth approximately equal to the height of

the falls, and at the lower end to excavate a room in the shale and limestone large enough for the generating machinery. From this underground power station, a nearby horizontal tunnel would carry the tail water from the wheels to some point near the foot of the falls. 1905 Clark

Perhaps the most interesting suggestion in the way of new power developments at Niagara, is that to sink a vertical shaft at the upper end of Goat Island, and then to excavate a nearly horizontal tunnel from the foot of this shaft to the lower end of the island, near the water level in the gorge. The power plant in this plan may be located either at the upper end of the island and have an equipment of vertical shafts, wheels and generators, or at the lower end of the island and near the tail water level.

Among the types of power development now represented at the falls, that with the vertical shaft or pit near an intake, the wheels at the bottom of this pit, and the generators at the tops of vertical shafts in a power house above, is the most common. This plan, first executed by the Niagara Power Company at their two generating stations on the American side of the great cataract, has since been followed by the Canadian Niagara Power Company and the Toronto & Niagara Power Company, whose plants are both located on the Canadian side of the falls.

Prior to the developments with deep wheel pits and long discharge tunnels, came that of the Niagara Falls Hydraulic Power and Manufacturing Company with its open surface canal extending from the intake above to the cliffs below the falls, and its power house at the foot of the cliff. This type of plant has its latest development in the works of the Ontario Power Company, whose generating station is being built in the gorge near the foot of Horse Shoe Falls; in this case, however, a long line of steel pipe, instead of a canal, brings water from the upper river.

. . . . .

In each of these types of development, whether it be the pit and tunnel with power house at the level of the upper river or

1905
Clark

the canal or pipe line with a power house in the Niagara gorge at the foot of the long line of escarpment that faces Lake Ontario, the general problem is the same. Namely, to utilize more or less of the total fall of about 327 feet made by the discharge of Lake Erie before it reaches the Lake Ontario level.

In order to render any great part of this fall effective at water wheels, they must be located near the lower level. This being so, a main distinction between the two general types of development is that in one the hole or pit in which the wheels are located must be excavated in existing rock, while in the other type the work of excavation has been done by nature, either in the Niagara Gorge or at the foot of the escarpment.

Where the level at which the wheels are placed is a natural one, the tailrace requires little or no excavation; this is the case in the Niagara Gorge, or at the foot of the escarpment. If the wheel pit is excavated to a great depth, then the tailrace takes the form of a long tunnel through the limestone or shale that underlies the Niagara region. When the power house is located in a natural depression like the gorge, or on the plain at the foot of the escarpment, a channel must be excavated on a pipe line laid near the natural ground level to bring water from the upper river.

Other things being equal, the location of the water wheels and power house at some natural level, instead of in and partly above an excavated pit, saves at the start most of the cost of such a pit. In a given case the length of the water conduit, whether canal, pipe line or tunnel, must be substantially the same, but a canal or pipe line is quite sure to have a materially lower cost than that for a tunnel of equal capacity. With a given head of water on the wheels, the length of steel penstocks must be about the same whether these wheels are in an excavated pit, in the gorge, or at the foot of the escarpment. The pit with wheels at the bottom and a power house at the top has the further disadvantage that the length of shaft connecting each

generator with its wheel must be about equal to the head of water, and that the weight and cost of the shaft and of its supports must be correspondingly great. 1905 Clark

For these reasons, the plants now under construction about Niagara Falls have either their generators and wheels in pits as close as possible to the falls, so as to reduce the amount of excavation in both pits and tunnels, or else have them located in the gorge or at the foot of the escarpment and supplied with water through a canal or pipe line. For future plants designed to develop power with water from the upper river, canals or pipe lines are quite certain to have the preference.

(The) Conclusions of the Niagara power companies regarding Niagara. (Elec. rev., March 25, 1905. 46:494.) 1905

The Ontario Power Company's summary of power available at Niagara and the courses open to municipalities in relation to its development.

DeWeese, Truman A. How Niagara is "harnessed." (R. of R., July, 1905. 32:58–64.) 1905 DeWeese

A discussion of power development in progress on the Canadian side, taking up the problems presented, the difficulties to be met, the engineering features of the various constructions, the uses of the power developed, and the effects of diversion. The author thinks that "the real danger to the falls will come from the granting of additional franchises in the future."

Dunlap, Orrin E. Canadian electric power stations at Niagara. (Nature, Dec. 14, 1905. 73:161–162.) 1905 Dunlap

A brief description of the plans of the three Canadian companies.

Dunlap, Orrin E. The Canadian Niagara Falls development. (Elec. rev., May 5, 1905. 56:737.)

A review of the 19th Annual Report of the Queen Victoria Niagara Falls Park Commissioners on electrical development on the Canadian side.

Dunlap, Orrin E. Curious engineering feat at Niagara. (Sci. Am., Nov. 11, and 25, 1905. 93:382–423.)

An account of the concrete column which was erected on shore and then tipped over into the river in order to act as a dam and raise the water in the power company's intake.

1905 Dunlap. DUNLAP, ORRIN E. Electrical development at Niagara Falls, Canada. (Elec. rev., Feb. 10, 1905. 56:231.)

A description of the plans and plant of the Ontario Power Company.

1905 (The) Electric power development at Niagara Falls. (Sci. Am., Aug. 12, 1905. 93:117–118.)

Editorial comment together with a bird's-eye view of Niagara Falls and vicinity showing the location of the three great power plants under construction on the Canadian side.

1905 (The) Electro-chemical industries of Niagara Falls. Electro-chem. and metal. ind. July, 1905. 3:253–255.)

"An address on this subject, delivered on June 22, by Mr. Francis A. J. Fitzgerald of Niagara Falls at the Buffalo meeting of the American Chemical Society, was highly interesting and suggestive in two respects; firstly, for the reason that Mr. Fitzgerald treated the subject from an evolutionary point of view, observing the effects of those most important factors in evolution, the struggle for existence, the influence of environment, etc., in the development of the Niagara electro-chemical products made commercially at Niagara Falls were here publicly discussed for the first time."

1905 Hydraulic features of the latest Niagara power plant. (Eng. news, Nov. 30, 1905. 54:577–578.)

Deals with the special features and the boldness of design of the Ontario Power Company in comparison with the older companies. Especially interesting from the point of view of the hydraulic engineer.

1905 Hydro-electric developments of the Ontario power company. I. (Elec. wld. and eng., Aug. 26, 1905. 46:342–345.)

Gives the general plan, describes the intake works, in detail with views and diagrams.

Hydro-electric developments of the Ontario power company. II. (Elec. wld. and eng., Sept. 2, 1905. 46:387–389.)

Describes the pipe line and the power station.

Hydro-electric developments of the Ontario power company. III. (Elec. wld. and eng., Sept. 9, 1905. 46:440–441.)

Deals with the distribution and control of the current, the distributing stations and the transmission line.

Niagara power in the gorge. I. (Elec. wld. and eng., Nov. 18, 1905. 46:857–859.)

THE WHIRLPOOL

In the Rapids below the Falls

A historical study of the power situation in the gorge with special reference to the lower plant of the Hydraulic Power and Manufacturing Company, and the uses of the power so developed. **1905**

Niagara power in the gorge. II. (Elec. wld. and eng., Nov. 25, 1905. 46:899–900.)

Account of the development of the Hydraulic Power and Manufacturing Company with a description of the new station and equipment.

Niagara power in Toronto. (Elec. wld. and eng., June 24, 1905. 46:1167–1170.) **1905**

Description of transmission lines and stations.

NUNN, PAUL N. The development of the Ontario power company. (Presented at 22d ann. conv. of the Am. inst. elec. eng'rs. Asheville, N. C. June 19–23, 1905.) **1905** Nunn

New departures at Niagara Falls.

NUNN, PAUL N. Hydro-electric enterprise in Canada. (Can. eng., March, 1905. 13:72–88.)

Ontario power company's plant at Niagara Falls. (Sci. Am., Feb. 11, 1905. 92:126.) **1905**

A description of the forebay, flumes, generators, and capacity of the plant.

Ontario power plant at Niagara. (Elec. wld. and eng., March 18, 1905. 45:508.) **1905**

Progress and development of the plant.

Opening of the Niagara Canadian power company's plant. (Sci. Am., Feb. 4, 1905. 92:104–105.) **1905**

A discussion of the capacity and units of the new plant and its relation to the American plant.

KENYON, O. A. Utilization of Niagara Falls. (Elec. wld. and eng., June 3, 1905. 46:1038.) **1905** Kenyon

Letter to the editor on the economic value of Niagara Falls.

Rise of Niagara power. (Elec. wld. and eng., Oct. 14, 1905. 46:654–656.) **1905**

This clear and concise account of the rise and development of Niagara power is both readable and accurate.

Hydraulic developments for power purposes about Niagara Falls represent neither an invention nor a revolution, but a growth.

1905 Substantially every type of hydraulic construction in the great plants now nearing completion has had a forerunner on an humble scale. Wheel pits and tunnels, canals and pipes, horizontal wheels and vertical shafts, stations above the falls and stations in the gorge below, have been repeatedly constructed on different scales as the engineering arts and the methods of power distribution have advanced.

Perhaps the first industrial application of Niagara power was that in the sawmill built by the French in 1725, on the New York bank of the river near the upper rapids, for the purpose of making lumber to be used in Fort Niagara. From the date just named down to about 1800 sawmills appear to have been constantly in use along these rapids. Augustus Porter built a sawmill on the New York bank of the upper river in 1805, and two years later Porter and Bacon erected a gristmill near the same location. It seems probable that small heads of water were obtained at these mills by means of short canals approximately parallel with the river bank. From about 1822 to 1885, in which latter year the mainland opposite Goat Island was taken as a part of the New York State Park, a canal ran from near the head of the upper rapids down toward the American Falls, and mills were built between this canal and the river. In these rapids there is a fall of about 50 feet, and a part of this head was utilized by taking water from the canal to the wheels, and then discharging it into the river above the falls. Bath Island lies between the New York bank and Goat Island, and was the site of a paper mill as early as 1825. This mill, destroyed by fire in 1858, was replaced by another which met a like fate in 1882, and the third mill seems to have been in operation on this island when it was taken for the state park in 1885. Five tons of paper was the daily production of the second mill. The third mill had turbines of 400 hp capacity. The head of water for these wheels could have been no more than the fall of the rapids along the sides of this small island. As late as the year last named there was standing between a canal and the river, a little

above the Cataract House, a gristmill of Witmer Brothers, built in 1822, which operated with three turbine wheels. Not far from the Cataract House a wing dam ran out into the rapids and diverted water into a short canal, as late as 1882, and between this canal and the river were several mills with turbine wheels that had an aggregate capacity of at least 525 hp. The largest of these mills was that of Hill & Murray, where 10 tons of wet pulp were manufactured daily with the aid of turbines of 400 hp capacity. From this same canal, in 1879, water began to be taken to operate a Brush arc dynamo with a capacity for twenty 4,000 cp lamps. The dynamo was driven by a 33-in. turbine wheel of 36 hp capacity under the water head of 12 ft. Prospect Park and the Falls were lighted by arc lamps equipped with reflectors and connected to this dynamo. Thus it seems that before 1885, when the state park displaced most of these mills, the rapids above the American Falls were operating turbines with a total capacity of about 1,000 hp, at heads much less than the 50 ft., which these rapids might have been made to furnish. Water used for this power development was returned to the river above the crest of the Falls. Meantime the diversion of water above the Great Cataract, and its discharge into the gorge below for power purposes, had already begun. As early as 1842 Augustus Porter proposed a canal to lead water from the upper Niagara River to the gorge, and in 1853, the Porter family granted the Niagara Falls Hydraulic Co. a plot of land having a frontage of 425 ft. on the upper river, extending for nearly a mile along the Gorge below the Falls, and with a width of 100 ft. in a strip 4,400 ft. long between these river frontages. The object of this grant was to secure the construction of a canal from a point above to one below the Falls, so that mills might locate at the lower end of the canal and have a high head of water. Excavation of this canal began with a celebration in 1853. 1905

Completion of the work was delayed for lack of funds, but Horace H. Day secured the property in 1860, and, on July 1, 1861, finished the canal with a length of 4,400, a width of 36,

1905 and a depth of 8 ft. This canal terminates in a basin near the top of the Gorge with a water surface of 210 ft. above that of the river below. Further development was arrested at this time by the Civil War, and it was 1870 before any of the great power thus made available was utilized. About that time the Gaskill gristmill was built at the lower end of the canal. This mill appears to have been equipped with turbines of 100 hp capacity under not less than 25 ft. head. In 1877 the canal just mentioned and the river frontages at its upper and lower ends were purchased by the Niagara Falls Hydraulic Power & Manufacturing Co. and Schoellkopf & Matthews began the erection of a flour mill to utilize a part of the power in the same year. This mill was located at the top of the cliff near the lower end of the canal, was 64 x 126 ft. on the ground in its main part, six stories in height, and was equipped with two American turbine wheels with a combined capacity of 900 hp under a head of 50 ft. Water was carried down to these wheels through a boiler-iron pipe 9 ft. in diameter, and this development had the highest head and the greatest power capacity of any that had been made at Niagara Falls up to that time. The original Gaskill mill, that of Schoellkopf & Matthews nearby, and all those erected at the end of the canal in question for about twenty years utilized the water power by sinking wheel pits in the cliff and then excavating a nearly horizontal tunnel from the bottom of each pit to the face of the cliff in the Gorge. Turbine wheels were located at the bottoms of these pits, the water from the canal after passing through the wheels was discharged from the tunnels, and a vertical shaft from each wheel delivered its power at the top of the cliff. All of these wheel pits were excavated before turbine wheels for heads of 100 ft. and over could be readily procured, and the depths of the pits ranged approximately between 25 and 90 ft. Water being thus discharged into the Gorge high up on the face of the cliff, the greater part of the

power that might have been obtained from it was wasted. In 1881, one of the wheel pits in question was sunk to a depth of 86 ft. below high water level in the canal, and was given an area of 20 x 40 feet. From the bottom of this pit a tunnel 160 feet long and 10 x 6 ft. in cross-section was cut to the face of the cliff. In the pit three 45-in. turbine wheels were placed, and each of these wheels, rated at 1,000 hp, was supplied with water through an iron penstock seven ft. in diameter. About one year earlier than this, in 1880, the Cataract Manufacturing Co. installed a 48-inch American turbine in a pit of sufficient depth to give a water head of 83 feet to furnish 1,300 hp for the manufacture of wood pulp. The two wheels first installed quickly broke under the head just named, but the third was of much greater strength and able to withstand the pressure. For this 48-in. wheel a circular pit 8 ft. in diameter was excavated through the rock, and from the bottom a tunnel 6 ft. in diameter was cut to the face of the cliff. The wheel was placed on the ledge at the bottom of the pit, which filled with water during operation, and the vertical shaft was braced at intervals by stays across the pit. A distinct advance in the use of high water heads at Niagara Falls was made in the two pits last named, and what was there done has been repeated on a larger scale in some of the recent power work. A number of pits besides those named were sunk from time to time along the top of the cliff at the lower end of the canal, and the discharge from their tunnels creates a miniature Niagara even to this day. 1905

During the winter, water falling from the tunnel outlets freezes before it reaches the river, and forms a small mountain of ice in the Gorge. In 1899 the aggregate capacity of the water wheels supplied by the canal and mechanically connected to the machinery of manufacturing plants along the cliff was 7,523 hp.

Among these plants was that of the Cliff Paper Company, especially notable as the first to utilize substantially the entire

1905 head of Niagara Falls and the first to be located in the Gorge. This company operates a paper mill at the top of the cliff, and a pulp mill at its foot, at the edge of the river. After passing down a wheel pit in the cliff and driving turbines under a head of 75 ft. the water for the pulp mill goes into an iron penstock and drops another 125 ft. to horizontal Leffel wheels that develop about 2,500 hp. From the tail race of these wheels the water flows directly into the river. This pulp mill in the Gorge was erected and operated before either of the great electric stations at Niagara Falls were built, and prior to 1895, only two of these stations, one on the American and another on the Canadian side of the river, have since followed it to the foot of the cliffs. One of these stations, that of the Niagara Falls Hydraulic Power & Manufacturing Co. close to the pulp mill of the Cliff Paper Co. began to generate electric power in 1896, with horizontal turbines operating under a water head of 210 ft. from the canal above. This was the first electric station to locate in the gorge.

During the previous year another plan for the development of power with the combined head of the Falls and upper rapids had been carried to completion in the plant of the Niagara Falls Power Company. Between 1883 and 1885, Thomas Evershed, an engineer engaged in the survey of the Niagara Falls Park Reservation, proposed a tunnel running beneath the city of Niagara Falls, and a system of canals and wheel pits, for the purpose of power production. The tunnel was to have a length of about 2.5 miles, was to connect with smaller tunnels, and was to vent at water level in the Gorge, just north of the reservation. Main and branch canals were to divert water from Niagara River above the upper rapids, and to deliver it in wheel pits along the lines of tunnels, for turbine wheels located on the pit floors. A company was formed to carry out this idea in a revised form, under which the wheel pits were brought close together and electric distribution of power was to take the place of branch canals and tunnels. For the development of electric

energy the generators were to be mounted at the tops of vertical shafts that rose from turbine wheels near the bottom of each pit. The plan finally adopted included a surface canal 250 ft. wide at its head on the river front, 1.25 miles above the American Falls, 1,700 ft. long in a direction approximately at right angles with the river, and 12 ft. deep. On either side of this canal a wheel pit was to be excavated to a depth of 178 ft., and a tunnel 7,436 ft. long was to connect the bottoms of the pits with the river, in the gorge below the Falls. The tunnel width was 18.82 ft., its height 21 ft., and its area in cross-section 386 sq. ft. Ground was broken for this development on October 4, 1890, and the first sale of electric energy was to the Pittsburg Reduction Co. for the production of aluminum on August 26, 1895. The canal and tunnel were designed for a capacity of 120,000 hp., at the head of 136 ft. utilized in the first wheel pit. In the great wheel pit and tunnel of 1895 may be seen an extension of the plan followed in the hydraulic development for the Gaskill mill more than twenty years earlier. Each plant included a canal to bring the water from the upper river, a wheel pit with turbines at the bottom, a vertical shaft rising from each wheel to the ground level and a tunnel to discharge the tail water into the gorge. In the later development, however, the tunnel is more than a mile instead of only a few feet in length, the head in 136 ft. to 150 ft. instead of 25, and the capacity is 120,000 instead of 100 hp. 1905

The plant of the Niagara Falls Power Company set the pattern for electric stations with wheel pits and tunnels, and the Niagara Falls Hydraulic Power & Manufacturing Co. by locating its generating equipment at the foot of the cliff, in 1895, fixed a type for those who run pipes down into the Gorge and connect them with horizontal turbine wheels for the operation of electric generators. Both of these examples on the American side of Niagara River have been followed on the Canadian bank. In Queen Victoria Park the generating plants

1905 of the Canadian Niagara Power Co. and the Toronto Niagara Power Co. are reproductions of the electric stations with tunnels, wheel pits and vertical shafts on the New York bank, with such minor improvements as experience has dictated.

In the Gorge, close to the foot of the Horseshoe Falls and diagonally across the river from its American prototype of ten years ago, is the new plant of the Ontario Power Co. This plant, like that of the Hydraulic Power and Manufacturing Co. across the Gorge, takes water above the upper rapids, leads it from the top to the foot of the cliffs in steel pipes, passes it through horizontal turbines that are direct connected to their electric generators, and discharges it into the lower river. While the much larger and later plant of the Ontario Power Co. presents many modifications of detail, perhaps its most striking departure from its prototype is in the use of a steel pipe line instead of a canal to bring the water to the top of the cliff.

1905 Significance of the hydro-electric developments at Niagara Falls. (Elec. rev., Feb. 11, 1905. 46:224–225.)

An editorial on the amount of power in use and prospective. Power development in the United States is compared with that in other countries.

1905 Smith SMITH, CECIL B. Construction of Canadian Niagara power company's one hundred thousand horse-power hydro-electric plant at Niagara Falls, Ont. (Trans. Can. soc. c. e. Jan., 1905. 19:62–82.)

A description of the construction work, buildings, and machinery. An abstract of the article may be found in the *Electrical Review*, New York, New York, December 2, 1905.

SMITH, CECIL B. Hydro-electric power plants in the Canadian Niagara district. (Eng. mag., Feb., 1905. 28:727–752.)

A comprehensive survey of the advantages of the district and of the various plants and their distinctive features by one "most intimately familiar with the entire scheme of development of the Niagara water power."

1905 Turbines of the Ontario power company, Niagara Falls. (Elec. wld. and eng., April 11, 1905. 45:652.)

Describes the turbines of the horizontal type, of the largest capacity ever built.

Electric power development at Niagara Falls. I. (Sci. Am., Aug. 12, 1905. 93:125–126.) 1905

A general survey of the power situation, in which it was shown that at the present time there are in operation, or under construction, on both sides of the Niagara River, electric power plants whose combined horse-power is about 500,000 and that if to this amount be added the total amount of power for which charter rights have been granted, the total development at Niagara, when the full limit of these charters has been reached will be about 9,000,000 horse-power.

Electric power development at Niagara Falls. II. (Sci. Am., Oct. 21, 1905. 93:320–321.)

A description of the 125,000 horse-power plant of the Electrical Development Company.

(The) Waste of Niagara. (Indep., March 16, 1905. 58:618–620.) 1905

An editorial in humorous and sarcastic vein on the wastefulness of Niagara as a scenic spectacle merely.

1906

Adams, Alton D. Proposed dam for Lake Erie. (Sci. Am., Feb. 10, 1906. 94:127.) 1906 Adams

A scheme for insuring a more constant volume at Niagara Falls.

Buck, Harold W. Niagara Falls from the economic standpoint. (Outl., May 19, 1906. 83:133–136.) 1906 Buck

An argument in defense of commercial utilization of the Falls. For editorial comment, see pages 106–107.

"The author of this article is an electrical engineer of standing, who has had a long and authoritative experience in the scientific development of electric power at Niagara Falls."—*Ed. note.*

There is another side to this question, however — the economic one — which has been forced to the front by the developments in science, engineering, and industry during the past ten years, and this phase of the situation cannot be set aside without careful consideration. The development of power at Niagara to-day is not the result of vandalism. It is not a manifestation of the greed

1906
Buck

of the capitalist for further wealth, nor is it the evidence of the granting by legislatures of monopolistic privileges to the few. Broadly speaking, it is solely the physical expression of the law of supply and demand. . . .

The water is being diverted for power purposes solely because, in the economic and industrial development of the country, the power is needed. This demand, like all commercial demands, is the net result of the actions and desires of all the individuals of the country.

The author goes on to state that the capitalists are not the only ones benefited by the development of the Niagara power, but that the real benefit goes to the manufacturer and purchaser of the products cheapened by the use of electricity.

The economic side of the Niagara problem is a serious one, and it cannot be set aside as secondary to that of the scenic interests. It must be cleared of the prejudices which now discredit it, and its importance to the country at large must be recognized. Niagara Falls is a great continental asset, not only as a scene, but also as a source of power, and any fair adjustment between the two interests must be made upon the basis of a reasonable compromise. The wave of exaggerated sentimentalism now passing should not be allowed to sweep aside all reason, nor be the only thing considered.

1906
Dunlap

DUNLAP, ORRIN E. The crime against Niagara. (Harp. w., April 7, 1906. . . . 50:pt. 1. 474–476.)

"It has been estimated," says Mr. Dunlap, "That should all the power companies which have authority to use water from the Niagara river, carry out their undertakings upon anything like the scale adopted by the companies whose works are now under construction, the falls of Niagara, considered as a scenic spectacle, would be most grievously impaired, if not entirely destroyed."

DUNLAP, ORRIN E. A great concrete retaining wall. (Sci. Am., May 12, 1906. 94:395–396.)

This wall, supposed to be the highest concrete wall in existence, was built by the Niagara Falls Hydraulic Power and Manufacturing Company to face the cliff and protect its power station.

DUNLAP, ORRIN E. A new 130,000 horse-power plant at Niagara Falls. (Sci. Am., Oct. 6, 1906. 95:244–245.) **1906** Dunlap

A description of the lower plant of the Niagara Falls Hydraulic Power and Manufacturing Company.

Electric power development at Niagara Falls. III. (Sci. Am., March 24, 1906. 94:248–249.) **1906**

A history of the development of power on the Niagara and a discussion of the advantages of the Canadian side together with a description of the distinctive features of the Canadian Niagara plant.

Electric railway development at Niagara Falls. (Elec. rev., July 28, 1906. 40:234.) **1906**

According to the article, a widely known engineer has said that "in his belief, the day was not distant when every locomotive between Syracuse and Cleveland, and in all that territory not more than 100 miles from Niagara Falls, would be operated from power generated there."

HOUSTON, EDWIN J. Half a decade of progress in electricity and magnetism. (Cass., Feb., 1906. 29:286–288.) **1906** Houston

A brief description of industrial processes depending on the Niagara Falls Power Company.

International waterways commission. (U. S. & Can.) Report upon the existing water power situation at Niagara Falls, so far as concerns the diversion of water on the American side, by the American members of the International waterways commission and Cap't Charles W. Kutz, corps of engineers, U. S. A. Wash.: Gov't printing off. 1906. **1906**

Contains a description of the plants, estimates of water needed, and recommendations for permits for the power companies.

International waterways commission. (U. S. & Can.) Second interim report of the Canadian section and first joint report of the commission. Ottawa: 1906.

The Niagara Falls question is fully taken up in this report and the one cited above, the dangers from diversion are considered, limitations are urged for the use of the water power, and recommendations are made.

Niagara Falls power developments. (Elec. rev., Aug. 17, 1906. 59:265.) **1906**

Permits under the Burton law.

1906 Niagara power schemes. (Eng., Feb. 16, 1906. 81:218–220.)

A review of a lecture by Professor Unwin before the Institution of Mechanical Engineers (London) giving an account of Niagara developments and problems and the effect of diversion on the Falls.

1906 (The) Power of Niagara. Niagara Falls Power Company. Niagara Falls, N. Y.: 1906.

An attractive and compact advertising pamphlet setting forth the capacity of the plants named, the cost of and advantages in using Niagara power.

Many plans were devised for the harnessing of Niagara, but it was not until 1888 that a feasible one dawned upon the horizon of the world's work. Then it was that the United States granted a series of patents covering the generating and distributing of what were termed polyphase electrical currents. The invention embodied in these patents made possible the transmitting of electrical energy over great distances. With such a possibility reasonably assured, the Niagara Falls Power Company began on October 4, 1890, the construction of its first great hydro-electric generating station. Not quite five years later electrical power for commercial purposes was delivered from that station, and on November 15, 1896, the same power was first used commercially in Buffalo, twenty-five miles away.

Beginning with the modest number of three generators and the small output capacity of 15,000 electrical horse-power, the first generating station grew to a capacity of 50,000 electrical horse-power; and then a second station close by was completed, with an additional capacity of 50,000 electrical horse-power, whilst across the river in the Dominion of Canada, a third station was being built, which to-day has available 50,000 electrical horse-power out of an ultimate output of 110,000 horse-power.

1906 Rankine RANKINE, WILLIAM B. National cyclopedia of American biography. . . N. Y.: White, 1906. Vol. XIII. Pp. 286–287.

Brief history and description of the exploitation of Niagara water-power with special reference to the developments of the Niagara Falls Power Company and the Canadian-Niagara Power Company.

WELLS, H. G. "The end of Niagara." (Harp. w., July 21, 1906. 50:pt. 2. 1018–1020.) 1906 Wells

A description of the power development at Niagara in characteristic fantastic style.

Everywhere in the America I have seen the same note sounds, the note of a fatal gigantic economic development, of large prevision and enormous pressures.

I heard it clear above the roar of Niagara — for, after all, I stopped off at Niagara.

As a waterfall, Niagara's claim to distinction is now mainly quantitative, its spectacular effect, its magnificent and humbling size and splendor, were long since destroyed beyond recovery by the hotels, the factories, the power-houses, the bridges and tramways and hoardings that arose about it. It must have been a fine thing to happen upon suddenly after a day of solitary travel; the Indians, they say, gave it worship; but it's no great wonder to reach it by trolley car through a street hack-infested and full of adventurous refreshment-places and souvenir-shops and the touting guides. There were great quantities of young couples and other sightseers, with the usual encumbrances of wrap and bag and umbrella, trailing out across the bridges and along the neat paths of the reservation parks, asking the way to this point and that. Notice boards cut the eye, offering this and that for twenty-five and fifty cents, and it was proposed you should keep off the grass.

After all, the gorge of Niagara is very like any good gorge in the Ardennes, except that it has more water; it's about as wide and about as deep, and there is no effect at all that one has not seen a dozen times in other cascades. One gets all the water one wants at Tivoli; and one has gone behind half a hundred downpours just as impressive in Switzerland; a hundred tons of water is really just as stunning as ten million. A hundred tons of water stuns one altogether, and what more do you want? One recalls "Orridos" and "Schluchts" that are not only magnificent but lonely.

1906
Wells

No doubt the falls, seen from the Canadian side, have a peculiar long majesty of effect; but the finest thing in it all, to my mind, was not Niagara at all, but to look up-stream from Goat Island and see the sea-wide crest of the flashing sunlit rapids against the gray-blue sky. That was like a limitless ocean pouring down a sloping world towards one, and I lingered, held by that, returning to it through an indolent afternoon. It gripped the imagination as nothing else there seemed to do. It was so broad an infinitude of splash and hurry. And, moreover, all the enterprising hotels and expectant trippers were out of sight.

That was the best of the display. The real interest of Niagara for me was not in the waterfall, but in the human accumulations about it. They stood for the future, threats and promises, and the waterfall was just a vast reiteration of falling water. The note of growth in human accomplishment rose clear and triumphant above the elemental thunder.

For the most part these accumulations of human effort about Niagara are extremely defiling and ugly. Nothing — not even the hotel signs and advertisement boards — could be more offensive to the eye and mind than the Schoellkopf Company's untidy confusion of sheds and buildings on the American side, wastefully squirting out long tail-race cascades behind the bridge, and nothing more disgusting than the sewer-pipes and gas-work ooze that the town of Niagara Falls contributes to the scenery. But, after all, these represent only the first slovenly onslaught of mankind's expansion, the pioneers' camp of the human-growth process that already changes its quality and manner. There are finer things than these outrages to be found.

These dynamos and turbines of the Niagara Falls Power Company, for example, impressed me far more profoundly than the Cave of the Winds; are, indeed, to my mind, greater and more beautiful than that accidental eddying of air beside a downpour. They are will made visible, thought translated into easy and commanding things. They are clean, noiseless, and starkly powerful. All the clatter and tumult of the early age of

machinery is past and gone here; there is no smoke, no coal grit, no dirt at all. The wheel-pit into which one descends has an almost cloistered quiet about its softly humming turbines. These are altogether noble masses of machinery, huge black slumbering monsters, great sleeping tops that engender irresistible forces in their sleep. They sprang, armed like Minerva, from serene and speculative, foreseeing and endeavoring brains. First was the word and then these powers. A man goes to and fro quietly in the long clean hall of the dynamos. There is no clangor, no racket. Yet the outer rim of the big generators is spinning at the pace of a hundred thousand miles an hour; the dazzling clean switch-board, with its little handles and levers, is the seat of empire over more power than the strength of a million disciplined, unquestioning men. All these great things are as silent, as wonderfully made, as the heart in a living body, and stouter and stronger than that. . . . 1906 Wells

When I thought that these two huge wheel-pits of this company are themselves but a little intimation of what can be done in this way, what will be done in this way, my imagination towered above me. I fell into a day-dream of the coming power of men, and how that power may be used by them. . . .

For surely the greatness of life is still to come; it is not in such accidents as mountains or the sea. I have seen the splendor of the mountains, sunrise and sunset among them, and the waste immensity of sky and sea. I am not blind because I can see beyond these glories. To me no other thing is credible than that all the natural beauty in the world is only so much material for the imagination and the mind, so many hints and suggestions for art and creation. Whatever is, is but the lure and symbol towards what can be willed and done. Man lives to make — in the end he must make, for there will be nothing left for him to do.

And the world he will make — after a thousand years or so!

I, at least, can forgive the loss of all the accidental, unmeaning beauty that is going for the sake of the beauty of the fine order and intention that will come. I believe — passionately

1906
Wells

as a doubting lover believes in his mistress — in the future of mankind. And so to me it seems altogether well that all the froth and hurry of Niagara at last, all of it, dying into hungry canals of intake, should rise again in light and power, in ordered and equipped and proved and beautiful humanity, in cities and palaces and the emancipated souls and hearts of men. . . .

I turned back to look at the power-house as I walked towards the falls, and halted and stared. Its architecture brought me out of my day-dream to the quality of contemporary things again. You know, it is such an inconceivably dull piece of building — a box of bricks exterior for these engineering splendors — a shock, a scandal like a bowler-hat on the king of kings. What an architect! I'd almost as soon have had one of the Schoellkopf sheds.

For a time my prophetic mood was altogether damped.

A community that can produce such things as those turbines and dynamos, and then cover them over with this dull exterior, is capable, one feels, of a feat of bathos. One feels that all the power that throbs in the copper cables below may end at last in turning great wheels for excursionists, stamping out aluminum fancy-ware, and the illumination of night advertisements for drug-shops and music-halls. I had an afternoon of busy doubts. . . .

There is much discussion about the question of Niagara at present. It may be some queer compromise, based on the pretence that a voluminous waterfall is necessarily a thing of incredible beauty, and a human use is necessarily a degrading use, will "save" Niagara and the hack-drivers and the souvenir-shops for series of years yet, "a magnificent monument to the pride of the United States in a glory of nature," as one journalistic savior puts it. It is, as public opinion stands, a quite conceivable thing. This electric development may be stopped after all, and the huge fall of water remain surrounded by gravel paths and parapets and geranium-beds, a staring-point for dull wonder, a crown for days' excursion, a thunderous impressive accessory to the vulgar love-making that fills the surrounding hotels, a Titanic imbecility of

wasted gifts. But I don't think so. I think somebody will pay something, and the journalistic zeal for scenery abate. I think the huge social and industrial process of America will win in this conflict, and at last swallow up Niagara altogether. 1906 Wells

It will receive that, as it has received so much, to return us — what?

U. S. WAR DEPARTMENT. Hearings in the matter of the granting of permits for the transmission from the Dominion of Canada into the United States of power from the Niagara river, before the Secretary of War at Washington, D. C. Nov. 26, and 27, 1906. Wash.: Gov't print. off. 1906. 1906 U. S. War Department

Included are the statements of J. Horace McFarland, A. K. Potter, F. W. Stevens, F. D. Deberard, Henry E. Gregory, Dr. John M. Clarke, Clinton Roger Woodruff, Hon. Charles M. Keep, Francis Lynde Stetson, W. Caryl Ely, Gen. Francis V. Greene, Morris Cohn, Jr., Paul D. Cravath, John G. Johnson, and Frank A. Dudley, representatives of various interests connected with Niagara Falls, U. S. Engineers, etc.

UNWIN, W. CAWTHORNE. The Niagara Falls power stations. Proc. inst. M. E. Lond.) 1906. Pp. 135–148. 1906 Unwin

This is the epitome of a lecture delivered at the graduates meeting on February 12, 1906, and contains eighteen beautiful plates. The early utilization of the Falls is described, and the development of the different American and Canadian power companies discussed. The possible destruction of the scenic effect of the Falls is dealt with and the author says, "Obviously when the works are complete there will be a serious alteration in the appearance of the Falls."

1907

(The) Burton bill and its effects on electric developments at Niagara Falls. (Elec. wld. and eng., June 29, 1907. 49:1291–1294.) 1907

Discusses the provisions and restrictions of the bill and permits granted under it, its general effects, and the effect on the Canadian company and on the market for power.

Canadian-Niagara power company's transmission to Buffalo. (Elec. wld. and eng., June 29, 1907. 49:1299–1302.) 1907

Description of the lines crossing the river and of the terminal station B of the Cataract Power and Conduit Company.

1907
Dunlap

DUNLAP, ORRIN E. Illuminating Niagara with its own power. (Sci. Am., Oct. 19, 1907. 97:273–274.)

A description of the machinery used for the illumination and the effect on the Falls.

1907
Greene

GREENE, FRANCIS V. Niagara Falls in 1907. Ontario Power Company of Niagara Falls.

A paper read before the American Civic Association at the annual convention, Providence, R. I., November 19, 1907. A stereopticon lecture illustrated by seventy-five diagrams and views. The author is the vice president of the Ontario Power Company. Says Mr. Greene: "I trust that I have reassured you as to any fears you may have that, under the law and the conditions as they now exist, there is any danger of Niagara Falls being destroyed. We are not now, and never have been, parties to any plans which would in any way endanger this sublime spectacle. The works of all the companies which have been partially constructed will not, when carried to completion on plans already approved, take out of Niagara enough water to change its appearance."

1907
Mershon

MERSHON, RALPH D. The transmission plant of the Niagara, Lockport and Ontario Power Company. (Trans. Am. inst. elec. eng'rs. N. F. June 26, 1907. 26:pt. 2, 1273–1317.)

"This event," says the author, speaking of the opening of the Niagara, Lockport and Ontario transmission line, "marks the inauguration of one of the first undertakings in the matter of distributing Niagara power over a large section of country, and the beginning of an enterprise which is one of the most important, and in some respects the most important of its kind anywhere in the world." He then goes on to describe in detail the capacity, length and construction of the line.

1907

Niagara. The Niagara Falls Power Company, Niagara Falls, N. Y., and the Canadian Niagara Power Company, Ontario, April 1, 1907. Bensler Press Company. Buffalo: n. d.

A pamphlet containing information for visitors, an account of the harnessing of Niagara, a description of the plants of the two companies, together with views and diagrams and maps of the developments, transmission lines and distributing stations.

That Niagara Falls represented a natural source of tremendous power was known, but the mere recognition of a possible source of power is not the real problem in its commercial develop-

ment. Two other factors require even greater consideration — first, some means must be provided for converting the forces of nature into some useful and marketable form of energy, and second, when it is converted into a useful form of energy, a sufficient demand for the power must be created to justify its development upon a large and practical scale. 1907

(The) Niagara dispute. (Elec. wld. and eng., Jan. 5, 1907. 49:13.) 1907

Note on the power of the federal government under the Burton act.

(The) Niagara Falls power question. (W. elec., Jan. 26, 1907. 40:93.) 1907

Discusses the permits for transmission of power from Canada issued by Secretary of War Taft.

Niagara power at Syracuse. (Ry. and eng. rev., June 1, 1907. 47:458–459.) 1907

Electric current generated from the large power plants at Niagara Falls has recently been made available at points further distant from the source of supply than even were supplied before. . . . The system as already constructed reached half way across New York State in the direction of its greatest length. At these remote distances from the central station the power is being put to many uses, perhaps the most important of which are for the operation of various electric railway systems. The Erie Railroad in the electrification of its Rochester division is using, as its source of power, current from the lines of the Niagara, Lockport and Ontario Power Company. . . . Still more remote from the Falls is the city of Syracuse, and the Syracuse Rapid Transit Company, which operates the street railways in that place, has recently arranged to receive a large part of its current from the long distance transmission lines.

Oxley, J. Macdonald. Niagara under yoke. (Wld. to-day, Sept., 1907. 8:298–306.) 1907 Oxley

The article deals particularly with the Canadian situation. To quote: "Nowhere the world over may you find a more convincing illustration

1907 Oxley of the hard, practical spirit of the age than on the Canadian side of the most famous of cataracts. Those who are prone to value none but paying facts have verily had their triumph here, and the votaries of the sublime and beautiful have been put to utter rout."

1907 Urban URBAN, HENRY. Utilisation des chutes du Niagara. (Societe Belge d'electriciens. Feb., 1907. 24:33–48.)

An account of the development and distribution of the Niagara Falls Power Company and the Ontario Power Company. The article also contains some diagrams.

1908

1908 Arnot ARNOT, RAYMOND H. The industries of Niagara Falls. (Pop. sci. mo., Oct., 1908. 73:306–318.)

A simple and interesting study of Niagara Falls as an electro-chemical center.

1908 Behrend BEHREND, B. A. A large new generator for Niagara Falls. (Trans. Am. inst. elec. eng'rs. Atlantic City, July 1, 1908. 27:pt. 2, 1057–1068.)

A technical and detailed description of machinery for the new plant of the Niagara Falls Hydraulic Power and Manufacturing Company.

1908 Electric power in Ontario. (Power, Nov. 3, 1908. 29:754.)

Discussion of hydro-electric power in Ontario with special reference to the situation at Hamilton by the consul in Hamilton. (Quoted from the Consular and Trade reports.)

1908 Greene GREENE, FRANCIS VINTON. The equities at Niagara. . . . Wash. (1908.)

A statement submitted on behalf of the Lower Niagara River Power and Water Supply Company of New York; the Niagara, Lockport and Ontario Power Company of New York, and the Ontario Power Company of Niagara Falls, Canada. The statement is a plea for the removal of the prohibitions of the act of June 29, 1906.

1908 (The) long distance transmission record. (Elec. wld., May 2, 1908. 51:888–889.)

An editorial on Niagara power in Auburn, New York, 163 miles away, "probably the longest twenty-four-hours-a-day transmission yet in use."

MERSHON, RALPH D. Losses and critical voltages of high tension transmission lines. (Eng. dig., Sept., 1908. 4:256–257.) **1908** Mershon

This paper " has mainly to do with the results of the work carried on at Niagara Falls, but in the treatment of these results the work at Telluride (Colorado) and that of Professor Ryan will necessarily be referred to and discussed." The article is a condensation of a paper entitled, " High Voltage Measurements at Niagara " read before the American Institute of Electrical Engineers, Atlantic City, June 29, 1908.

Niagara power. (Elec. wld., June 13, 1908. 51:1721.) **1908**

A digest of the report of the International Waterways Commission.

WILLIAMS, ARCHIBALD. How it is done, or, Victories of the engineer. (N. Y. Nelson. 1908c. Pp. 467–484.) **1908** Williams

A discussion dealing with the waste of energy at the Falls, the history of the use of Niagara, the modern power companies and their plants and methods.

1909

KOESTER, FRANK. Hydro-electric developments and engineering. N. Y. D. Van Nostrand Co. 1909. (See index.) **1909** Koester

Among the references in the index are 327 of the power plant and transmission system of the Ontario Power Company, and also some dealing with the architectural features of the Niagara Power Company.

1910

The development of electric power at Niagara Falls. (Nature, April 7, 1910. 83:173–176.) **1910**

From a paper entitled, "An account of a visit to the power plant of the Ontario Power Company at Niagara Falls," read before the Institution of Mechanical Engineers, January 7, 1910, by Mr. C. W. Jordan. The article describes the intake, conduits, spillway and weir, power house, and machinery of the company.

Niagara Falls power company and Canadian-Niagara power company. Information for visitors. April 1, 1910. **1910**

Historical and descriptive.

THOMPSON, SYLVANUS PHILLIPS. Life of William Thompson, baron Kelvin of Largs. Lond. Macmillan. 1910. 2 Vols. (See index to volume 2 under Niagara.) **1910** Thompson

1910 Thompson

On his visit to Niagara in 1897 to investigate the industrial development, Lord Kelvin said to the press, "I do not myself believe that any such limit will be found to the use of this great natural source. I look forward to the time when the whole water from Lake Erie will find its way to the lower level of Lake Ontario through machinery, doing more good for the world than even that great benefit which we now possess in contemplation of the splendid scene which we have before us in the waterfall of Niagara. I wish I could live to see this grand development. I do not hope that our children's children will ever see the Niagara cataract."

1911

1911 Canada Commission of Conservation

CANADA COMMISSION OF CONSERVATION. Water powers of Canada, by Leo G. Denis and Arthur V. White. Ottawa. The Mortimer co. 1911. (See index.)

The portions of the book devoted to Niagara deal with the esthetic value of the Falls, the power possibilities, the existing situation, and the conditions governing development, as well as considerable data respecting the various companies.

The suggestion regarding the diversion of the waters of Niagara is quoted:

> It would be a wise precaution, when granting water privileges on a river, say, like the Niagara river, if the governments interested reserved the power to demand that waters diverted from a river must, if so required be temporarily returned to the river. Such a course would increase the flow and thereby assist in averting critical conditions that might arise as, for example a dangerous ice-jam which might be broken up by the agency of an increased flow of water taking place during the formative stages of the jam.

1911

(The) Power of Niagara Falls. Taking stock of the energy utilized. (Sci. Am. supp., Sept. 23, 1911. 72:208.)

This article is a quotation at length from Art in Engineering Supplement of the London Times, by Dr. J. W. Spencer.

1912

1912 Agassiz

AGASSIZ, GARNAULT. Niagara — the "Mighty Thunderer." A reprint from the National magazine for September, 1912.

Industrial Niagara

A description of the Falls, with an estimate of their power potentialities, and an account of the influence of that power on various industries. 1912 Agassiz

Gone is the Indian's superstition, the red man's impotency — terrible no more is the "Spirit of Niagara," ominous no longer is its voice. Where stood the Indian maid we now see in phantom a thousand temples of industry; where rode the mist, a cloud as of smoke wafted toward the setting sun; where rested the rainbow, the bridge that points man across the great divide. The "Mighty Thunderer" that for untold centuries has run his relentless way, checked only by the martial legions of King Winter, still hurls his troubled waters down the awful abyss; his voice still speaks forth from the unfathomable depths; his relentless spirit is still unassuaged, his pristine omnipotence still unchallenged; but these waters have been trained to another task, that voice finds echo in the whirr of myriad wheels, that power is reflected in a million ways; the "unconquerable one" is still unconquered — he has become a mighty ally in the upbuilding of civilization.

. . . . .

But the total power potentialities of the "Mighty Thunderer" will not be available for man's use for many generations to come, for conservative legislation on the part of the governments of Great Britain and the United States will hold in reserve so much of it as competent engineers deem essential to preserve the scenic beauty of the cataract until such time as its development shall have become an economic necessity of the hour.

. . . . .

Already, it might be said, the people of Ontario, with peculiar acumen and foresight, have created, in what is officially known as the Hydroelectric Power Commission, a government-controlled body, whose purpose is to distribute Niagara-developed power throughout the Province at cost, thus superinducing her industrial upbuilding.

This commission already has constructed 565 miles of transmission lines, to what effect can be best seen by a study of the

1912
Agassiz

wonderful manufacturing growth of Western Ontario in the past five years. Such thriving communities as Toronto, Hamilton, London, Guelph, St. Thomas, Woodstock, Brantford, and Stratford have already made marvellous progress in the few short years that they have been no longer dependent on American-mined coal as their one source of fuel supply, while the city of Welland alone has grown from 1,800 to 6,000 in the past three years, a record only excelled by Niagara Falls, New York, which has increased its population in the past decade from 20,000 to about 35,000 people.

The industrial growth of Canada, consequent to some extent at least on the Burton Act, is well illustrated by the fact that in 1907 Canada was taking less than one per cent of the power generated on the Canadian side, while today she is consuming almost as much as is the United States.

Few questions are fraught with more importance to the nation than the one involved in the industrial upbuilding of the Niagara frontier, which should become one day the greatest manufacturing region of the world. It is an economic problem that statesmen will have to work out with great care and conservatism.

. . . . .

Anomalous as it may seem, the hydro-electric development of Niagara Falls constitutes in itself one of the most remarkable chapters in the history of American conservation, aside altogether from the direct saving of fuel the utilization of this wonderful store of natural energy effects. For out of it has been evolved the modern electric furnace, which, with its products entering into every field of human endeavor, is now playing such an all-important role in the industrial upbuilding of the world.

Without Niagara and the electric furnace, indeed, the really marvellous progress that has been made in the arts and sciences in the past two decades would have been well-nigh impossible.

. . . . .

What Niagara Falls' power has accomplished for man's upbuilding through the electric furnace abrasive, is so stupendous

as to be almost unbelievable. The remarkable development of metallurgy in recent years has been made possible only by the modern grinding wheel, this being especially true of the copper, bronze, brass and aluminum industries. The automobile industry also has been greatly benefitted by it, for the cranks, shafts, special alloy steels and the roller and ball bearings for this intricate latter-day invention could never have been perfected without it. In dentistry it has been a wonderful factor, having made filling a comparatively easy art. Its importance will be realized when it is stated that it is now manufactured in sizes ranging from a pin's head to six feet in diameter. 1912 Agassiz

The uses of modern abrasives are so multitudinous, in fact, as to defy enumeration. They are used in the sharpening of saws and knives in the lumber industry; in the manufacture of porcelain, cut glass, agate ware, fine lenses, tumblers, boots and shoes, car wheels, and steel rails; wagons, plows, harvesters, and other farm implements; radiators, tools of every character; phonograph and graphophone needles; paper pulp; fountain pens and combs; surgical instruments; typewriter rolls; leather goods; German silver, rubber, celluloid and mother-of-pearl articles; in the polishing of granite, marble, onyx and terrazzo; in the cutting of carbon and graphite; in the hulling of rice; in the grinding of rollers for the manufacture of the best qualities of chocolate and cereal foods; in the tanning trades; in smoothing concrete and cleaning cement; in the finishing of automobile tires, and in a myriad other ways.

. . . . .

The influence of Niagara Falls' power on the production and price of electric storage batteries is too well known to need repetition, the price notwithstanding the enormously increased demand having decreased twenty-five per cent in the last five years. At Niagara Falls is located in the United States Light and Heating Company's establishment, the largest electric storage battery plant in the world. What more striking evidence of

1912
Agassiz

the part Niagara power is playing in conserving the natural wealth of the nation?

. . . . .

But it is in the field of electro-chemistry that Niagara hydro-electric power seems destined to find its most important province. Electro-chemistry is essentially a child of Niagara. Fifteen years ago this rapidly developing branch of science was in the laboratory stage, its possibilities unrealized, its potentialities practically unconceived, and it was only when Niagara endowed the electro-chemist with the power that permitted him to put to practical test the experiments of the laboratory that any real progress was made.

What has been accomplished in the last decade in the field of electro-chemistry belongs really to the category of the marvelous. Ten years ago the United States depended for its supply of chemicals wholly on foreign importations. Today things have changed. Such important chemicals as chlorate of potash, caustic potash, bichromate of soda, muriate acid, liquid chlorine, carbon tetrachloride, tin tetrachloride, bleaching powder, phosphurus, caustic alkali, metallic sodium, and cyamanid, are now manufactured either in whole or in part through electrolytic processes, increasing the efficiency of the product and very materially decreasing the price.

. . . . .

There is apparently no limit to the possibilities of Niagara-developed power. It has been shown that paper can be manufactured at Niagara Falls more economically than anywhere, because Niagara paper mills are never affected by water drought, a condition foreign to any other locality in the world. In the firing of china the Niagara electric furnace should also have a considerable future, for it has been demonstrated that with it china can be fired in as many hours as it now takes days, and the electric furnace has none of the discoloring qualities of coal.

Niagara is indeed the greatest of all conservators; and in serious contemplation must we not ask ourselves — Was this

wonderful storehouse of natural energy placed here merely as a tribute to the omnipotence of the Creator, or as a vital factor in the upbuilding of civilization? If the former, then we stand with the Indian and prehistoric man; if the latter, then we have a bounden duty as a nation to utilize this God-given gift. 1912 Agassiz

Two aspects of "conservation." (Metal. and chem. eng., Sept. 12, 1912. 10:574.) 1912

An editorial on the importance of electro-chemical industry at Niagara Falls and an expression of regret over the waste presented by the restrictions on power development.

In a few days our visitors will be at Niagara Falls. Much is there of which we are proud — the magnificent group of electrochemical industries, without a parallel of its kind in diversity and magnitude, and economically of importance only to be measured by a realization of what the artificial abrasives, aluminum, artificial graphite, caustic soda and chlorine, the ferro alloys, and its other products mean to industry in its larger aspect. A bold directness is perhaps the characteristic virtue of American engineering; and a better example could scarcely be found of that simplicity which is the truest efficiency than this group of electrochemical plants.

WILLIAMS, ARCHIBALD. The wonders of modern engineering. . . . Phila.: Lippincott. Lond.: Seeley, Service. 1912. Pp. 11–23. 1912 Williams

The chapter on "The Harnessing of Niagara" is from the "Romance of Modern Engineering" by the same author.

1913

Aluminum company of America. (Harp. w., June 14, 1913. 57: pt. 1, 25.) 1913

A description of "one of the greatest industries in this country."

BOLTON, REGINALD PELHAM. An expensive experiment; the hydro-electric power commission of Ontario. N. Y.: Baker & Taylor Company. 1913. 1913 Bolton

1913
Bolton

In answer to the fallacy that the Falls are wholly a source of gain and profit to the community Mr. Bolton says, " In other words, Niagara, like other water-falls is economically utilizable only to a limited extent, and so long as any fuel, either coal, oil, gas, lumber, peat, vegetable matter or extracts, is available as fuel, water power will continue to afford a restricted field of usefulness, bounded by strictly limited expenditure upon development. . . . The real value of the product must be measured by competition with other sources of energy."

1913

Effect of power development on the Canadian Falls at Niagara. (Metal. and chem. eng., June, 1913. 11:307.)

Letter by P. McN. Bennie to the editor questioning the impression given by the photograph in Bolton's " Expensive Experiment."

1913

The faith and courage of the pioneer. (Harp. w., June 14, 1913. 57:pt. 1, 24–25.)

A history of power development and its extension with special reference to the Niagara Falls Power Company, together with the discussion of the effective diversion and legislation affecting the power company.

1913

More aspects of conservation. (Metal. and chem. eng., March, 1913. 11:117–118.)

An editorial on Secretary Stimson's plea for more efficiency in the development of power. A plea by the editor for efficiency in consumption.

1913

New York hydro-electric development. (Metal. and chem. eng., June, 1913. 11:306.)

Letter to the editor on Reginald Pelham Bolton's arguments and statements in "An Expensive Experiment."

New York hydro-electric development and Niagara Falls. (Metal. and chem. eng., July, 1913. 11:370–371.)

Letters by Reginald Pelham Bolton, P. McN. Bennie and F. Austin Lidbury in regard to photograph and statements in Bolton's " Expensive Experiment."

1913

Niagara's oldest power plant. (Harp. w., June 14, 1913. 57:pt. 1, 16.)

A description of the Niagara Falls Hydraulic Power and Manufacturing Company's plant together with a discussion of federal legislation, the treaty with Great Britain, the effect of diversion, and its achievements for human comfort.

(Review of Bolton, Reginald Pelham. An expensive experiment.) (Metal. and chem. eng., July, 1913. 11:302.) 1913

This book is an amplification of the author's evidence before the New York State Committee on the subject of the activities, operation and results of the Hydro-Electric Power Commission of Ontario. . . .

Less satisfactory are those portions of the book which deal with the general subject of the development, transmission and utilization of hydro-electric power. . . .

We deplore these blots on the work all the more since there is no question but that the author has rendered a useful public service in throwing a clear light upon the Ontario Hydro-Electric Commission's position and in dispelling to a considerable degree, by definite figures, the secrecy surrounding its financial operations.

U. S. CONGRESS. House committee on foreign affairs. Diversion of water from the Niagara river. . . . Hearings before the committee Jan. 24, Feb. 15 and 17, 1913. Wash.: Gov't print. off. 1913. 1913 U. S. Congress

Statements of the Secretary of War and Mr. Frederick L. Lovelace, Secretary of the Niagara Falls Power Company revised.

U. S. CONGRESS. House committee on foreign affairs. Diversion of water from the Niagara river. Hearings before the committee Jan. 22, [24,] on bill proposed by the sub-committee on Niagara Falls legislation dated Jan. 15, 1913. Pt. 1, [2] Wash.: Gov't print. off. 1913. 1913

A discussion of state and federal rights by the representatives of the interests involved.

WILLIAMS, EDWARD T. Niagara in romance and commerce. (Harp. w., June 14, 1913. 57:pt. 1, 29.) 1913 Williams

" Glimpses of the pioneer days and of the twentieth century development at Niagara frontier."

WILLIAMS, EDWARD T. Using Niagara's power. (Harp. w., June 14, 1913. 57:pt. 1, 28.)

An article by the city industrial agent of Niagara Falls on the possibilities of power development, the effects of diversion and the Burton law.

1914

1914
Hubbard

HUBBARD, ELBERT. Power; or The story of Niagara Falls. . . . East Aurora, N. Y. 1914.

A history of the power development with special reference to the Hydraulic Power and Manufacturing Company. The Falls are cited as an ideal manufacturing district and many arguments advanced for the use of water power for industrial purposes. The future of the Falls is considered and many interesting facts concerning the region are given.

1914
U. S. Congress

U. C. CONGRESS. House committee on foreign affairs. . . . Diversion of water from Niagara river. 63d Cong., 2d sess. . . . Report to accompany house report 16,542. Wash.: Gov't print. off. 1914.

The chief subjects considered in the accompanying bill are the amount of water that may safely be taken from the Niagara river, to whom it should be given, the amount of power that ought to be generated from the water used, the amount of power that may be imported from Canada, who shall grant the permits, and what limitations and restrictions should be placed in such permits for the diversion of water and the importation of power.

U. S. CONGRESS. House committee on foreign affairs. Diversion of water from the Niagara river. Hearings. . . . 63d Cong., 2d sess. Jan. 16, 1914. Wash.: Gov't print. off. 1914.

Statements of Hon. Henry P. Velte, George F. Thompson, James W. Kelly, George E. Van Kennan, all of New York State, that they want 4,400 cubic feet of water in control of New York State so that Niagara may be protected from monopolistic control.

What we want is that this limitation under the Burton Act be set aside in any proposed legislation, and any additional water power granted shall be granted so that it shall be subject either to the approval of any of the governmental departments, of the Federal Legislature jointly with that of the State of New York. This is one of the propositions.

Another proposition is that the State of New York shall have the opportunity to say to whom the diversion shall go.—*Senator Velte.*

Rapids above the Falls

1915

DUNN, E——. Intermittent water-fall. (Sci. Am., Dec. 4, 1915. 113:492–493.) **1915 Dunn**

An account of Professor Norton's project for the utilization of the Falls without impairing their beauty. The article is written by a coworker of Professor Norton's and embodies the ideas for the intermittent use of the fall which appear in Professor Norton's article in the Popular Science Monthly of February, 1916.

1916

———, ———. Niagara on tap. (Lit. dig., April, 1916. 52:963–964.) **1916**

A review with extracts of the article of Professor Thomas H. Norton in the Popular Science Monthly for February, 1916.

NORTON, THOMAS H. Niagara on tap. (Pop. sci. mo., Feb., 1916. 88:180–184.) **1916 Norton**

"Professor Thomas H. Norton, in a paper which he read before the American Electro Chemical Society, outlined a scheme whereby it would be possible to satisfy those who see only the beauty of Niagara, and those who see only power going to waste. The following article by Professor Norton is an abstract from the paper in question especially revised for this issue of the Popular Science Monthly by its author.— Editor."

The article seems worthy of quotation as embodying the latest scheme for a compromise between the power interests at Niagara, and the efforts to preserve its scenic beauty.

There must be some practicable, workable thesis, according to the terms of which, on our own continent for example, the rights of its inhabitants shall suffer no material diminution in the opportunity to fully enjoy the splendor of Niagara, while conditions are created which permit the utilization, on a satisfactory scale, of the tremendous source of power — one of the nation's grandest assets.

The principle of an *intermittent waterfall* would appear to offer a simple, but thoroughly practicable solution. It may be briefly formulated as follows:

During somewhat more than half of the twenty-four hours, especially during the night time, a waterfall is completely harnessed. Every kilowatt which it is capable of creating is devoted

1916 Norton

to the service of industry. During a shorter period — from ten A. M. to eight P. M.— the cataract resumes its normal activity, contributing to the esthetic enjoyment of all who behold it.

. . . . . .

One-quarter of a mile above the western extremity of Goat Island, where ripples betray the beginning of the upper rapids, a dam would be constructed at right angles to the axis of the river. The length would be about four-fifths of a mile. Niagara River at this point is exceedingly shallow. . . .

The dam would possess the necessary architectural features to harmonize with the environment. The water impounded by the closing of the gates could be led by huge canals, on both sides of the gorge, to the edge of the bluff overlooking Lake Ontario. From this point a multitude of penstocks and rock tunnels would conduct the entire volume of water to the level of the river near Queenston on the Canadian side and Lewiston on the American side, where battalions of power-houses can easily be located.

. . . . . .

Once provided with the mechanical means to control the vast volume of water, ordinarily sweeping over the crest of Niagara, the daily program would be as follows:

At 8 P. M. the entire series of gates on the dam would simultaneously close. A few minutes later and the American Falls would falter. The volume of water would swiftly diminish. Soon the grand curtain would be rent and gashed as if by invisible knives. A minute or two more, and rivulets here and there pour over the brink. The gloomy, cavernous recesses beneath the overhanging edge are revealed to the eye. Another minute and the rivulets have changed to drops.

From Goat Island to the apex of the great Horseshoe the same sequence of transformation begins. It creeps steadily along the crest until it reaches the Canadian shore. The deafening roar of the cataract sinks to an agonizing groan, a reproachful sigh, a dying murmur. Niagara is silent!

A few minutes later and the rage and fury of the long stretch

of rapids in the picturesque gorge falter and slowly subside. 1916
The vast volume of water between the foot of the falls and Norton
Queenston gradually drains away. A quiet lake remains between the railroad bridges and the base of the falls. Its surface is about eighty-six feet below the normal level, and the enclosing cliffs gain that much in height. It would be somewhat narrower than the present river, and frequent rocky islands would appear near the temporary banks.

For three-quarters of a mile the relatively narrow and shallow bed of the whirlpool rapids would be laid bare. The whirlpool itself would remain a somewhat restricted and motionless sheet of water, forty feet below its normal level, at the head of a quiet fjord, extending inland from Lake Ontario. . . .

Synchronously with the vanishing of the falling tons of water, in thousands of workshops scattered over the fruitful territory of Ontario and New York, a million, perhaps many million, workmen begin their daily task. For fourteen hours the world's greatest beehive of industry is filled with the busy hum of activity, keyed to the highest pitch, banqueting, as it were, on the corpse of a murdered Niagara! One shift of seven hours is succeeded by another of the same length. All the energy of the seven million, four hundred thousand horsepower is devoted to the welfare of the nation.

It is 10 A. M. As the signal is flashed from the National Observatory the gates of the great dam shoot upward. The hum of spindle and loom, the clang of the triphammer, all the many-toned gamut of sound which forms the orchestral accompaniment of a busy, happy people shaping, fashioning, creating the objects of convenience or luxury destined for each other's comfort or enjoyment,— all sink to a whisper,— vanish!

A minute later and the crest of a vast billow sweeps over the brink of the American Fall. In an instant, almost, with a deafening roar of exultant joy, the cataract has sprung into full activity. Swiftly the falling curtain spreads from Goat Island along the crest of the semi-circle, until Niagara, in full panoply of

1916
Norton

power and might, hurls her defiance at the assembled multitudes gathered to witness the most wondrous sight on the face of the globe — the rebirth of a cataract. The spectacle would combine all the swiftness of movement and stupendous grandeur offered by the sweep of the Johnstown flood, of the tidal wave of Galveston, free from the tragic terrors and horrors of those cataclysms. The gloomy, beetling cliffs disappear behind the sheet of foam and spray; rainbows hover in the clouds of mist; the gray walls of the gorge echo back the roar of the proud cataract!

. . . . .

When used for motive power on railways, street-car lines, etc., in many branches of electro chemical industry, continuity of current is imperatively necessary. . . . It is, however, perfectly feasible to rescue a very large proportion of the power, ordinarily going to waste during the shorter period of the day, when the cataract resumes its normal activity, without affecting, to any noticeable degree, any elements of its scenic beauty.

In the deep recesses behind the falling sheet of water at Niagara, the Cave of the Winds, etc., a gigantic system of scaffolds could be erected. These would serve as the supports of a series of overshot wheels or endless chain-bucket wheels. By careful disposition a considerable fraction of the available power — possibly thirty or forty per cent.— could be utilized and directed to electro chemical or transportation centers without revealing any portion of the mechanism to the eye of the beholder gazing at the cataract. There would be a noticeable increase in the volume of the spray, which could tend only to heighten the scenic beauty of the waterfall.

. . . . .

It is scarcely necessary to state that during the fourteen hours of enforced quiet and rest, while the waters of the Great Lakes are diverted through a maze of penstocks, to dash upon thousands of turbines, the sight of a serried array of mechanical devices, lining the cliffs of Niagara, would be sadly out of harmony with the otherwise gloomy grandeur of the gorge.

Although this period covers the time ordinarily devoted to slumber, still in the evening and during the early forenoon, tourists and others would constantly gaze upon Niagara at rest. 1916 Norton

To remedy this feature, one per cent or less of the river's volume would be allowed to pass the dam and flow over the brink. It would generate a thin curtain of water just enough to hide the massive scaffolding and the maze of wheels. By simple hydraulic devices, this small amount of water could be largely transformed into spray. A delicate lace-like " bridal veil " would screen cliffs and every trace of commercialism.

. . . . .

It would mean the creation of an industrial metropolis, surpassing any now existing on the face of the globe. No cinders or soot would pollute its atmosphere; no towering chimneys would rise against the sky-line. Industries of the most varied nature, carbides, carborundum, aluminum, cynamid, chlorine, alkalies, steel, copper, and many minor branches — all dependent upon the electric current — would gravitate to this point. It would become in very truth — perhaps in name — the *electropolis of America!*

Summary

The history of Industrial Niagara is the history of one of the most vital economic developments of the age. More than one important industry has been entirely revolutionized by the application of Niagara power.

The first sawmill was built on the Niagara in 1725, and from that time traveler's accounts of the Falls contain many references to the mills seen there and the potential possibilities of such a waterfall, but it was not until 1880 that the real literature of Industrial Niagara had its beginning. From then on to the present day this aspect of Niagara has developed a tremendously interesting literature. Much of it is technical in presentation, the greater portion of it has appeared in periodicals, but it is easily obtainable in most communities.

The bibliographical list on this subject is so large, that if all the titles had been included within the confines of this chapter, it would easily have made a volume of itself. Those omitted on account of duplication of subject matter will be found in the alphabetical list at the end of the book. Neither was it possible to quote fully from many of the articles cited in the chapter, but from the notes and resumés any student of the subject may easily inform himself as to the context of any article cited.

In the longer quotations which are given, an effort has been made to choose those which present the broader aspects of the subject, in a manner appealing rather to the general reader than the technical student. With such a wealth of material from which to choose, the difficulty lay rather in elimination than selection. The subjects range from the earlier articles dealing with the potential power of Niagara, the history of the early power developments, the struggle to market the power, the solution of the transmission problem, the application of electric power generated at Niagara to various industries, down to the controversy waged between those advocates of an unlimited use of Niagara power regardless of the grandeur of the Falls, and those who, while believing in a proper use of this power for economic purposes still hold for restrictions which shall preserve the Falls for the future. The esthetic side of the controversy is more fully dealt with in the chapter on the " Preservation of Niagara."

Chapter XI

NEW YORK STATE RESERVATION AT NIAGARA

CHAPTER XI

PRESERVATION OF THE FALLS

1832

COKE, E. T. A subaltern's furlough: descriptive of scenes in various parts of the United States, upper and lower Canada, New Brunswick, and Nova Scotia, during the summer and autumn of 1832. Lond.: Saunders and Otley. 1833. Pp. 292–311. 1832 Coke

The author spent four days at the Falls. His calm, well-written account contains some excellent paragraphs on the preservation of the Falls.

The hotel, and 400 acres of ground, have been lately purchased by a company (of which, I believe, the British Consul at New York is the head), who purpose founding a city, which is to be commenced immediately, under the name of the " City of the Falls," or " Clifton " — I forget which. . . .

The company of speculators intend erecting grist-mills, store-houses, saw-mills, and all other kinds of unornamental buildings, entertaining the most sanguine hopes of living to see a very populous city. The die then is cast, and the beautiful scenery about the Falls is doomed to be destroyed. Year after year will it become less and less attractive. Even at this time they were surveying and allotting, and proprietors were planning one front of their house upon the Falls, the other upon Lundy's Lane, and meditating the levelling some of the rock, so as to form a pretty little flower-garden. It would not surprise me to hear, before many years have elapsed, that a suspension bridge has been thrown across the grand Horse-shoe to Goat Island, so that the good people of Clifton may be the better enabled to watch the pyramidical bubbles of air rising from the foot of the cataract. 'Tis a pity that such ground was not reserved as sacred in perpetuum; that the forest trees were not allowed to luxuriate in all

1832 Coke

their wild and savage beauty about a spot where the works of man will ever appear paltry, and can never be in accordance. For my own part, most sincerely do I congratulate myself upon having viewed the scene before such profanation had taken place. The small manufacturing town of Manchester (what a romantic name and what associations!), upon the American Bank, at present detracts nothing from the charm of the place, the neat white-washed houses being interspersed with trees and gardens; but when once the red and yellow painted stores, with their green Venetian blinds, tin roofs, and huge smoking chimneys arise, farewell to a great portion of the attraction Niagara now possesses.

A ferry-boat, half a mile below the Canadian Fall, crosses to Manchester, landing the passengers within fifty yards of the American one, where the water is precipitated over a flat perpendicular rock 300 yards in breadth. The prosperity of this village has been much retarded by two causes, one from its liability to destruction, being a frontier settlement; and the other — by no means an uncommon cause in the United States,— the extravagant price demanded by an individual, the great proprietor, for a grant of the water privileges allowed by the Rapids. Two or three hundred yards from the bank above the Ferry, and at the entrance to the village, a wooden bridge has been thrown over the Rapids to a small island on which there is a paper mill, and connected with Goat Island, which is of considerable extent, and divides the two falls. Truly the men who were employed in the erection of this bridge must have been in full possession of Horace's *aes triplex*, for a more perilous situation could scarcely be imagined. A slip of a workman's foot would precipitate him into the Rapids, whence he would pass with the rapidity of lightning over the Falls. It was constructed at the expense of General Porter, an American officer of distinction, during the late war, and appears strong and firmly situated. The piers are of loose stones, confined together by a wooden frame or box, and the floor of planks twelve feet in

width. There was one erected previously at the upper end of the island, and out of the great power of the Rapids, but it was continually subject to injury from the drift-ice, whereas in its present situation the Rapids render the ice harmless, by breaking it before it arrives so low as the bridge. 1832 Coke

1832–1833

ROLPH, THOMAS. A brief account, together with observations made during a visit in the West Indies, and a tour through the United States of America, in parts of the years, 1832–3; together with a statistical account of upper Canada. Dundas, U. C.: Hackstaff. 1836. Pp. 193–204. 1832–33 Rolph

This account is clear, pointed, self-restrained, and the details described are well-chosen.

I stood by Niagara. The grandest image of Power that nature has produced was before me. Of Power, I say, for with that are associated all my ideas of the sublimity of Niagara. It is the volume of waters that it pours, and not the height from which they fall — it is the accumulation of the mighty mass, and not the position in which accident has placed it, that strikes and overwhelms you — it is the fact of whole oceans being brought before the eye at one glance, and not the circumstance of their changing their level, that gives its majestic character to this stupendous scene. It is to the image of Almighty Power — it is to the type of Him who holdeth the waters in the hollow of his hand, that the soul bows in humility or lifts itself in sublimated awe. Here is the spot of all others upon the broad earth — and I have travelled it widely — where the nothingness* of human pride comes home upon the heart; where its hopes and its struggles — its aspirations after good and its conflicts against evil — its dreams of distinction and its repinings at obscurity — its hard wrestlings with the doom to which it is fated, sink into their native insignificance, when compared with the operations of the immortal Mind that is forever developing itself around us. . . .

Only a few buildings are yet seen peering from among the trees and shrubbery, and they have just begun to be a drawback

1832–33
Rolph

on the stern simplicity and unstudied grandeur of the scene. I fear, however, they are destined to become a positive nuisance, unless they are abated by the adoption of a more considerate course by visitors. This giving every other person who accosts you a few shillings to show some trumpery which you care not a straw for, may be the easiest way of ridding yourself of his intrusive company and the interruption which it occasions to some cherished train of thought; but it is a riddance at the expense of the next comer, and directly calculated to ensure the perpetual and harrassing annoyance of all future visitors. I wish it were provided by law that no building should be erected within sight of the little plot of ground immediately adjoining the cataract. As matters are now conducted, another twenty years may see the whole amphitheatre filled with grog-shops, humbug museums, etc., etc.,— Who knows but it may be profaned by cotton factories?

The country from Niagara to the Falls, a distance of eight miles, is well cleared; there are several large farms with excellent houses on them, and orchards containing the choicest kinds of peaches, pears and plums. In the summer months stages are continually running between Niagara and the Falls — Queenston stands nearly semi-distant between them.— From Queenston there is a coach to Hamilton, by St. Catherines, through a thickly settled and fertile country. . . .

1833

1833
Latrobe

LATROBE, CHARLES JOSEPH. Niagara. (*In* Barham, William, Descriptions of Niagara, selected from various travellers; with original additions. Gravesend. n. d. Pp. 105–111.)

Account taken from Latrobe's Rambles in North America; may be found in 2d edition. 1836. 1:72–80.

You may recollect my juvenile weakness, that of being a notorious cascade hunter. There was something in the notion of a waterfall which always made my brain spin with pleasure. Impelled by this passion, as a boy, I ransacked the moorland and mountain districts of the north of England, in quest of the

beautiful but diminutive specimens of this variety of natural scenery with which they abound; and at a later period, there was not an accessible waterfall within my range of travel, from the Rhine Fall to Tivoli, that I did not contrive to approach, gaze upon and listen to with infinite pleasure. So you may well ask what impression was made upon me by Niagara. 1833 Latrobe

I am glad that the position and the general features of this celebrated scene are too well known to need description, and that you will require none from me.

At the commencement of the present century, Niagara, difficult of access, and rarely visited, was still the cataract of the wilderness. The red Indian still lingered in its vicinity, and adored the 'Great Spirit' and 'Master of Life,' as he listened to the 'Thunder of the waters.' The human habitations within sound of its Fall were few and far apart. Its few visitors came, gazed, and departed in silence and awe, having for their guide the child of the forest, or the hardy back-woodsman. No staring, painted hotel rose over the woods, and obtruded its pale face over the edge of the boiling river. The journey to it from the east was one of adventure and peril. The scarcely attainable shore of Goat Island, lying between the two great divisions of the cataract, had only been trodden by a few hardy adventurers, depending upon stout hearts and steady hands for escape from the imminent perils of the passage. How is it now? The forest has everywhere yielded to the axe. Hotels, with their snug shrubberies, outhouses, gardens, and paltry embellishment, stare you in the face; museums, mills, staircases, tolls, and grog-shops, all the petty trickery of Matlock-baths, or Ambleside, greet the eye of the traveller. Bridges are thrown from island to island; and Goat Island is reached without adventure. A scheming company on the Canadian side have planned a 'City of the Falls,' to be filled with snug cottages, symmetrically arranged, to let for the season; and, in fine, you write to your friend in Quebec, giving him rendezvous at Niagara for a certain hour, start yourself from Richmond, in Virginia, for the point proposed, with a

1833
Latrobe

moral certainty of meeting at the very day and hour specified, by taking advantage of the improvements of the age, and the well-arranged mode of conveyance by steamers, railroads, canals, and coaches. In short, Niagara is now as hacknied as Stockgill Forge, or Rydal-water, and, all things considered, the observation of an unimaginative 'Eastern man' is said to have made, addressing a young lady-tourist, who was gazing breathlessly for the first time at the scene, was not so far out of keeping with it: "Isn't it nice, Miss?" Yes, all is nice, that that active little biped man has done, or is doing.

But do not suppose that we grew peevish at the sight of the blots upon the landscape to which I have alluded, and departed in wrath and disgust. We soon found that there is that in and about Niagara which was not to be marred by busy man and all his petty schemes for convenience and aggrandisement; and I may truly say, with regard to both our first and second visit, and stay within its precincts, that we were under the influence of its spell. While within the sound of its waters, I will not say that you become part and parcel of the cataract, but you find it difficult to think, speak, or dream of anything else. Its vibrations pervade, not only the air you breathe, the bank on which you sit, the paper on which you write, but thrill through your whole frame, and act upon your nervous system in a remarkable, and it may almost be said unpleasant, manner. You may have heard of individuals coming back from the contemplation of these Falls with dissatisfied feelings. To me this is perfectly incomprehensible, and I do not know whether to envy the splendid fancies and expectations of that class of travelers, to whom the sight of Niagara would bring disappointment, or to feel justified in doubting whether they have any imagination or eye for natural scenery at all. How blank the world must be, to them, of objects of natural interest! What can they expect to see?

As to expectations, ours were excited and warm, and I shall never forget the real anxiety with which we looked out, on our

ascent from Lewiston, for the appearance of the object of our visit. The broad fathomless blue river, streaked with foam, which, deeply sunk in a colossal channel, hurried to our rencontre, and appeared at every glimpse as we advanced swifter and in greater commotion, was to us a guarantee that the scene of its descent from the upper country could be no common one. When about three miles from the village on the American side, you gain your first view of the Falls, together with the river, both above and below — the island which divides them — and greater part of the basin at their feet. 1833 Latrobe

I will not say but that the impression of that first glance was heightened afterwards by our nearer and reiterated survey of every portion of the cataract in detail; yet we all agreed that we could even then grasp the idea of its magnitude, and that all we had seen elsewhere, and all we had expected, was far surpassed by what was then shown to us. And when, the following year, two of us turned aside by common consent to pay a second visit to Niagara, after having in the interval, visited many of the great Falls of Lower Canada,— cataracts in comparison to which all European Falls are puerile — and we felt our curiosity excited to divine what impression a second visit would make; far from being disappointed, we felt that before Niagara, in spite of its inferiority of elevation, all shrunk to playthings. It is not the mere weight and volume of water that should give this far-famed cataract the first rank. Every surrounding object seems to be on a corresponding scale of magnificence. The wide liquid surface of the river above, with its swelling banks, contrasted by the deep blue floods below, as boiling up from their plunge into the unfathomed basin, they shock against one another, and race down towards the distant lake; the extreme beauty of the forested defile, with its precipices and slope; the colouring of the waters, which in the upper part of its descent is that of the emerald; the mystery and thick gloom which hide the foot of the Falls, and add to their apparent height, and the floating clouds of vapour, now hurried over the face of the landscape, as though

1833 Latrobe

urged by the breath of a hurricane, and then slowly ascending, and hovering like a cloud in the blue sky, all combine to form a scene in which sublimity and picturesque beauty are enchantingly blended. There is here none of that stiffness, either in the scenery, or the form and appearance of the particular object of interest, which engravings too frequently give you the idea of.

Among the innumerable points of view, that from the precipitous shore of the river, about the distance I have alluded to, is the most satisfactory, if not the most striking. In the immediate vicinity of the Falls, the points of interest are so various, that if you would require a sketch, I should not know which to select. The grandest, doubtless, is from the Canadian shore, near the Horse-shoe Fall; but you pass from one to the other, and everywhere the picture presented has no compeer or rival in nature.

Many things combined to make us prefer choosing the village on the American shore for our halting-place, in preference to the garish hotel on the opposite site. The greater monotony of the right-hand division of the cataract, was counterbalanced by the grand distant view of its neighbour, and by the practicability of a near approach to both from Goat Island, to which an easy access is afforded by a boldly constructed bridge over the rapids. Besides, we agreed that the position of the village and its inns was not only more rural and secluded, but that better taste was exhibited in its details.

What a glorious scene! to sit upon the summit of the impending precipice of the island, and see, as we did the morning after our first arrival, the summer mist begin to rise and disengage itself from the heavy white cloud of spray which rose from the depth of the boiling basin of the great Fall beneath us. By degrees, the curtain was partially removed, revealing the wall of slowly descending water behind, now dimly descried,— as confounded with the floating sheets of foam and spray which the wind of the mighty cataract drove backward and forward over it like innumerable clouds of thin floating gauze,— it mocked us with its constantly varying shape and position; and then appearing

unveiled with its sea-green tints brilliantly illuminated by the pass- 1833
ing sunbeam. An hour after, and the mist had disappeared; the Latrobe
Falls were sparkling in the bright sunshine; and a brilliant iris was resting on the body of vapour which the wind carried away from the face of the descending columns. The scene at sunset, day after day, was no way less majestic, when the sun, glancing from the Canadian shore, lit up the precipices and woods of Goat Island, and the broad face of the American Fall, which then glowed like a wall of gold; while half the Fall of the Horse-Shoe, and the deep recesses of the curve, were wrapped in shade. Morning, noon and night found us strolling about the shore, and on the island, which is an earthly paradise.

I remember the quiet hours spent there, when fatigued with the glare of the hot bright sun, and the din of the Falls, with peculiar delight. We loved, too, to escape from all those signs of man's presence and busy-bodying, to which I have alluded, and, burying ourselves in the fresh dark scarce-trodden forest still covering a great part of its area, to listen to the deadened roar of the vast cataracts on either hand, swelling on the air distinct from every other sound.

There, seated in comparative solitude, you catch a peep across a long vista of stems of the white vapour and foam. You listen to the sharp cry of the blue jay, the tap of the red-headed woodpecker, and the playful bark of the squirrel; you scan the smooth white boles of the beech or birch, chequered with broad patches of dark-green moss, the stately elm and oak, the broad-leaved maple, the silvery-white and exquisitely chiselled trunk of the huge chestnut, garlanded with creepers; but you will hardly ever lose the consciousness of the locality. The spell of Niagara is still upon and around you. You glance again and again at the white veil which thickens or grows dim beyond the leafy forest: the rush of the nearer rapids, the din of the falling waters, the murmur of the echoes answering the pulsations of the descending mass, fill your ears, and pervade all nature.

1833
Latrobe

Everything around and about you appears to reply to the cataract, and to partake of it, none more so than the evergreen forest, which is bathed from year to year in the dew of the river. These noble trees, as they tower aloft on the soil, are sustained from youth to age by the invigorating spray of the mighty Falls. Their leaves are steeped, summer after summer, in the heavy dew; their trunks echo the falling waters, from the day they rise from the sod, to that in which they are shaken to the ground; and the fibres of the huge moss-grown trunk on which you sit, prostrate and mouldering on the rich soil beneath, bedded in the fresh grass and leaves, still vibrates to the sound of its thunders, and crumbles gradually to dust. But all this proves nothing — as a matter-of-fact man might say — but I am Niagara-mad. We have much before us, and many sublime scenes, though none may vie with that, before which we have been lingering: — *allons!*

Not so well known as some others, perhaps, but well worth reading.

1833
Power

POWER, TYRONE. Impressions of America, during the years 1834, and 1835. Lond.: Richard Bentley. 1836. 1:391–411.

From this house [Chippewa] the eternal mist caused by the great fall may be plainly seen curling like a vast body of light smoke, and shooting occasionally in spiral columns high above the treetops; but not a sound told of its neighborhood, although we were not five miles distant from it, and the day was calm and clear. At about three miles from this, as the vehicle slowly ascended a rise, I heard for the first time the voice of the waters, and called the attention of my friends within the carriage to the sound.

. . . . .

It was at the moment we struck the foot of the hill leading up to the hotel [Clifton House] that the rapid and the great horse-shoe fall became visible over the sunken trees to our right, almost on a level with us. I have heard people talk of having felt disappointed on a first view of this stupendous scene: by what

process they arrived at this conclusion I profess myself utterly incapable of divining, since, even now that two years have almost gone by, I find on this point my feelings are not yet to be analyzed; I dare not trust myself to their guidance, and only know that my wildest imaginings were forgotten in contemplating this awful reality. 1833 Power

. . . . .

. . . I found no sensation equal to a long quiet contemplation of the mass entire, not as viewed from the balconies of the hotel, but from some rocky point or wooded shade, where house and fence and man and all his petty doings were shut out, and the eye left calmly to gaze upon the awful scene, and the rapt mind to raise its thoughts to Him who loosed this eternal flood and guides it harmless as the petty brook.

There never should have been a house permitted within sight of the fall at least. How I have envied those who first sought Niagara, through the scarce trod wilderness, with the Indian for a guide; and who slept upon its banks with the summer trees for their only shelter, with the sound of its waters for their only *réveille.*

Now, one is wakened here by a bell, which I never can liken to any other than a dustman's, and can hardly find a spot whereto parasols and smart forage-caps intrude not.

I would even include in my denunciation the tower which is now erected upon the piece of rock that abuts upon the great fall, and standing in whose gallery you actually hang suspended over the abyss; not but that the tower is in itself rudely simple, and in good taste perhaps, but that one feels this place needs no such accessories, and, instead of deriving advantage from them, is degraded into a mere show by their presence; and, in saying this much, I feel as though the application of the term was a profanation.

1833–1834

1833–34
Abdy

ABDY, EDWARD STREET. Journal of a residence and tour in the United States of North America, from April, 1833, to October, 1834. Lond.: John Murray. 1853. 1:286–294.

The author, who is a good observer, seriously objected to the desecration of the Falls.

I could not, on recrossing the ferry, but lament, as I had done before, that a barbarous and sacrilegious hand had been permitted to outrage every feeling of taste, congruities or common sense, by placing a wooden bridge and a circular building, like a shot-tower, directly over one of the falls. Every person who has the slightest pretension to anything like susceptibility of tender or lofty emotions from the view of external objects, should have protested against the wild schemes of a " money-changer," that have marred the simplicity and purity of this " solemn temple "— interrupting the devotion of the worshipper, and mingling with his admiration of the Divine architect disgust at the arts and contrivances of unfeeling trade and avaricious speculation. The name of this Vandal is, I believe, Porter. It is to him that the island, with its appurtenances, belongs; and it is for the sake of extracting a few additional dollars from the pockets of the curious, that this vile sacrilege has been committed.

1834

1834
Reed & Matheson

REED, ANDREW *and* MATHESON, JAMES. A narrative of the visit to the American churches by the deputation from the Congregational union of England and Wales. Lond.: Jackson & Walford. 1835. 1:116–129.

Written in the form of letters.

I am sorry, in closing, that I cannot say much for the taste either of the visitors or inhabitants of this spot. The visitors seemed to regard the Falls rather as an object of curiosity than otherwise, and when they had satisfied their curiosity (which in most cases was very quickly done), and could report that they had seen them, the duty was discharged. Such persons drove in

on the morning, explored for a couple of hours, dined, and hurried away. Or, if they stayed, they had had enough of Niagara, and they made an excursion to see the burning springs. The album here, too, is full of miserable trash; it is a sad contrast to the album at Chamouni. 1834 Reed & Matheson

With the residents I am half disposed to be angry. On the American side they have got up a shabby town, and called it Manchester. Manchester and the Falls of Niagara! A proposition has been made to buy Goat Island, and turn it into a botanical garden, to improve the scenery — and such scenery! On the Canadian side, a money-seeking party have bought up 400 acres, with the hope of erecting "The City of the Falls;" and still worse, close on the Table Rock, some party was busy in erecting a mill-dam! One has hardly patience to record these things. The universal voice ought to interfere, and prevent them. Niagara does not belong to them; Niagara does not belong to Canada or America. Such spots should be deemed the property of civilized mankind; and nothing should be allowed to weaken their efficacy on the tastes, the morals, and the enjoyments of all men.

1837

DAUBENY, CHARLES. Journal of a tour through the United States and in Canada, made during the years 1837–38. T. Combe, ptr. Oxford: 1843. Pp. 44–48. 1837 Daubeny

The author, who was professor of chemistry and botany in the University of Oxford, visited the Falls in the fall of 1837. He gives detailed descriptions of the points of interest and laments the evidences of "human ingenuity" so near the Falls. He also examined the mineral springs near the Falls to determine their composition.

Thus I had imagined, that the fury of the waters, after they had been launched over the cataract, would have been more terrific, and was surprised at seeing the ease, with which an insignificant ferry-boat crossed the stream within a very short distance below. The noise also, produced by the waterfall itself, I had conceived would have been more stunning, and it was with a

1837 Daubeny

feeling nearly allied to what one might entertain at hearing a person of solid weight and character talked down by a noisy upstart of yesterday, that I found the roar of this stupendous natural phenomenon overpowered by the hissing of a locomotive, which was letting off its steam at the railroad station adjoining.

The presence of these evidences of human ingenuity was, in other respects, likewise very unpropitious to the feelings which the scene itself was calculated to inspire, and though no enemy to rail-roads or factories in their proper places, I could have wished all vestiges of the one and of the other banished from a spot where nature ought to have been allowed to reign undisturbed and alone.

1841

1841 Carlisle

Carlisle, George William Frederick Howard. Two lectures on the poetry of Pope, and on his own travels in America. Delivered to the Leeds Mechanics' Institution and Literary Society, December 5th and 6th, 1850. Leeds. 1850. Pp. 25–26.

. . . The first view neither in the least disappointed, or surprised, but it wholly satisfied me. I felt it to be complete, and that nothing could go beyond it; volume, majesty, might, are the first ideas which it conveys; on nearer and more familiar inspection I appreciated other attributes and beauties — the emerald crest — the seas of spray — the rainbow wreaths. Pictures and panoramas had give me a correct apprehension of the form and outline; but they fail, for the same reason as language would, to impart an idea of the whole effect, which is not picturesque, though it is sublime; there is also the technical drawback in painting of the continuous mass of white, and the line of the summit of the Fall is as smooth and even as a common mill-dam. Do not imagine, however, that the effect could be improved by being more picturesque; just as there are several trivial and unsightly buildings on the banks, but Niagara can be no more spoiled than it can be improved. You would, when on the spot, no more think of complaining that Niagara was not picturesque, than you would remark in the shock and clang of battle that a trumpet sounded

out of tune. Living at Niagara was not like ordinary life; its not over loud, but constant solemn roar, has in itself a mysterious sound: is not the highest voice to which the Universe can ever listen, compared by inspiration to the sound of many waters? The whole of existence there has a dreamy but not a frivolous impress; you feel that you are not in the common world, but in its sublimest temple. 1841 Carlisle

1842

LYELL, *Sir* CHARLES. Life, letters and journals of Sir Charles Lyell, *Bart.* Lond.: Murray. 1881. 2:61. 1842 Lyell

A brief paragraph in a letter to Leonard Horner, dated Lewiston, June 13, 1842, commenting on the strange effect of locomotives, tourists, and traffic on one absorbed in sky, wood, and water. The distinguished scientist thought Goat Island a perfect fairyland but longed for a view of the Falls in their aboriginal setting. He speaks with apprehension of the approaching intrusion of factories on the scene.

1847

WARBURTON, GEORGE DROUGHT. Hochelaga; or England in the new world. Lond.: Colburn. 1847. 1:230–244. 1847 Warburton

Impressions of the Falls are interspersed with anecdotes of casualties.

By painting and by description, Niagara had been familiar to me for many years, as no doubt it has been to every one else; so much has been said and written on the subject that any attempt to throw new light upon it is hopeless. I, therefore, mean, with simple egotism, to give the impressions it made upon myself.

The sight was precisely what I expected — the sensations it caused, totally different. I did not start with an exclamation of awe, neither did I only look upon it as "an everlasting fine 'water-privilege.'" I thought it a magnificent cataract, far grander than anything I had before seen, and more beautiful. I sat down on the turf near Table Rock, whence there is the best view, with something approaching to disappointment on my mind, that, after all, it should be only a "magnificent cataract." But as I looked and listened, the eye and ear, as it were, matured into the power to fit perception; then, admiration and astonish-

1847
Warburton

ment, and, at last, almost confusion, came upon me; sight and sound seemed to have joined their strength and merged into a vague impression — vague, but of mighty force. A passing stranger addressed some question to me, which aroused me; I found that, unconscious of the lapse of time, I had been for hours staring at the great wonder.

I got up reluctantly, and proceeded to the nuisance of sight-seeing, but looked back every now and then as though fearing that I should lose the rest of the grand spectacle; for I could not but fancy that it was some strange and transient phenomenon, or a display got up by some enormous effort for the moment. When night came, it seemed reckless waste to keep it going still, while its glorious beauty was hidden from mortal view.

It was not till increasing distance freed me from its influence, and when thought returned, that I knew it had been going on yesterday, last year, for a century, for tens of centuries — back to that deep abyss of the past, on which sceptic science—presumptuous though feeble — has dared to shed a dim and sinister light, of only sufficient strength to show, that the depths must remain forever — inscrutable as profound.

Now, the neighborhood of this great wonder is overrun with every species of abominable fungus — the growth of rank bad taste: with equal luxuriance on the English and American sides, Chinese pagoda, menagerie, camera obscura, museum, watch-tower, wooden monument, tea-gardens, " old curiosity shops." A boy handed me a slip of paper on which were printed some stanzas of astounding magnificence, signed "Almira," much in the favorite style of the poet laureate to " Moses and Son." I cannot refrain from giving a short quotation:

" Would ye fain steal a glance o'er life's dark sea,
And gaze though trembling on eternity?
Would ye *look out, look down*, where God hath set
His mighty signet? Come — come higher yet,
To the PAGODA'S utmost height ascend,
And see earth, air, and sky in one alembic blend! "

"Pagoda is now open to visitors and perfectly secure. . . . Admittance 25 cents. . . . 1st April, 1845." 1847 Warburton

1849

BONNYCASTLE, *Sir* RICHARD HENRY. Canada and the Canadians. New ed. Lond.: Colburn. 1849. 1:233–244. 1849 Bonnycastle

But, gentle reader, although it be a well-worn tale, I had not seen the Falls for five years, and I wish to tell you whether they are altered or improved; and most likely you will take some little interest in so old a friend as the Falls of Niagara; for you must have read about those before you read Robinson Crusoe, and have had them thrust under your notice by every tourist, from Trollope to Dickens. They say, *on dit*, I mean, which is not translatable into English, that this is the age of Materialism and Utilitarianism. By George, you would think so indeed, if you had the chance of seeing the Falls of Niagara twice in ten years. They are materially injured by the Utilitarian mania. The Yankees put an ugly shot tower on the brink of the Horseshoe at the beginning of that era, and they are about to consummate the barbarism, by throwing a wire bridge, if the British government is consenting, over the river, just below the American Fall. But Niagara is a splendid "Water Privilege," and so thought the Company of the City of the Falls — a most enlightened body of British subjects, who first disfigured the Table Rock, by putting a watermill on it, and now are adding the horror of gin-palaces, with sundry ornamental booths for the sale of juleps and sling, all along the venerable edge of the precipice, so that trees of unequalled beauty on the bank above, trees which grow nowhere else in Canada, are daily falling before the monster of gain.

What they will do next in their freaks it is difficult to surmise; but it requires very little more to show that patriotism, taste, and self-esteem, are not the leading features in the character of the inhabitants of this part of the world.

1849
Bonnycastle

If the Colossus of Rhodes could be remodelled and brought to the Falls, one leg standing in Canada, and the other in the United States, there would be a company immediately formed for hydraulic purposes, to convey a waste pipe from the tips of the fingers as far as Buffalo; and another to light the paltry village of Manchester, all mills and mint-juleps, with the natural gas which would be made to feed the lamp. A grog-shop would be set up in his head; telescopes would be poked out of his eyes, and philosophers would seat themselves on his toes, to calculate whether the waters of the British Fall could not be dammed out, so as to turn a few cotton mills more in Man-chester, as it is called, which scheme some Canadian worthy would upset, by resorting to Mr. Lyell's proof that the whole river might once have flowed, and may again be made to flow, down to St. David's — thus, by expending a few millions, cutting off Jonathan's chance.

But it is of no use to joke on this subject; Niagara is, both to the United States and to England, but especially to Canada, a public property. It is the greatest wonder of the visible world here below, and should be protected from the rapacity of private speculations, and not made a Greenwich fair of; where pedlars and thimble-riggers, niggers and barkers, the lowest trulls and the vilest scum of society, congregate to disgust and annoy the visitors from all parts of the world, plundering and pestering them without control.

The only really pretty thing on the British side is the Museum, the result of the indefatigable labors of Mr. Barnett, a person who, by his own unassisted industry, has gathered together a most interesting collection of animals, shells, coins, &c., and has added a garden, in which all the choicest plants and flowers of North America and of Britain grow, watered by the incessant spray of the Great Fall. In this garden I saw, for the first time in Canada, the English holly, the box, the heath, and the ivy; and there is a willow from the St. Helena stock.

It requires unremitting watchfulness, however, to keep all this together, for *loafers* are rife in these parts. He had gathered a

very choice collection of coins, which was placed in a glass case in the Museum. 1849 Bonnycastle

. . . . .

He is now forming a menagerie, and also has a collection of fossils and minerals from the neighborhood, with a camera obscura. He is, in short, a specimen of what untiring industry can accomplish, even when unassisted.

There are some tulip-trees near the Falls, but this plant does not grow to any size so far north; and, although native to the soil, it is, perhaps, the extreme limit of its range. The snake-wood, a sort of slender bush, is found here, with very many other rare Canadian plants, which are no doubt fostered by the continual humidity of the place; and, if you wish to sup full of horrors, Mr. Barnett has plenty of live rattlesnakes.

To wind up all, the Americans are going to put up another immense gin-palace on the opposite shore; and, as a climax to the excellent taste of the vicinage, they are about to place a huge steamboat to cross the rapids at the foot of the Manchester Falls. The next speculation, as I hinted above, must be to turn the Niagara into the Erie, or into the Welland Canal, and make it carry flour, grind wheat, and do the duty which the political economists of this thriving place consider all rivers as alone created for.

One traveller of the Utilitarian school has recorded, in the traveller's album at the Falls, the number of gallons of water running over to waste per minute; and another writes, "What an almighty splash!"

I went once more to see the Burning Spring, and have no doubt whatever that the City of the Falls, that great pre-eminent humbug, if it had been built, might have easily been lit by natural gas, as it abounds everywhere in the neighborhood, the rock under the superior Silurian limestone being a shale containing it, as may be evidenced by those visitors, who are persuaded to go under "the Sheet of Water," as the place is called where the Table Rock projects, and part of the cataract slides over it; for,

1849
Bonnycastle

on reaching the angle next to the spiral stair, a strong smell is plainly perceptible, something between rotten eggs and sulphur; and there you find a little trickling spring oozing out of the precipice tasting of those delectable compounds.

A Yankee, with the soaring imagination of that imaginative race, proposes to set fire to the Horse-shoe Fall, and thus get up a grand nocturnal exhibition, to which the Surrey Zoological pyrotechny would bear the same ratio as a sky-rocket to Vesuvius.

There is no great impossibility in this fact, if it was "not a fact" that the rush of the Fall disturbs the superincumbent gases too much to permit it; for there can be but little doubt that there is plenty of *materiel* at hand, and, some day or other, a light-house will be lit with it to guide sleepy loons and other negligent water-fowl over the Falls. I wonder they do not get up a Carburetted Hydrogen Gas Company there, with a suitable engineer and railway, so that visitors might cross over to Goat Island on an atmospheric line. There are plenty of railway stags on both shores, if you will only buy their stock to establish it; and, at all events, it would improve the City of the Falls, which now exhibits the deplorable aspect of three stuccoed cottages turned seedy, and a bare common, in place of a magnificent grove of chestnut trees, which formerly almost rivalled Greenwich Park.

But the crowning glory of "the City" is the Reflecting Pagoda, a thing perched over Table Rock bank, very like a huge pile engine, with a ten-shilling mirror, where the monkey should be. Blessings on Time! though he is a very thoughtless rogue, he has touched this grand effort of human genius in the wooden line slightly, and it will soon follow the horrid water-mill which stood on that most singular and indescribable freak of Nature, the Table Rock. I would have forgiven Lett, the sympathizer, if instead of assassination and the blowing-up of Brock's Monument, he had confined his attentions to a little serious Guy Fauxing at the Mill and the Reflecting Pagoda.

Niagara — Ne-aw-gaw-rah, thou thundering water! thy glories are departing; the abominable Railway Times has driven along thy borders; and, if I should live to see thee again ten years hence, verily I should not be astounded to find thee locked-up, and a station-house staring me in the visage, from that emerald bower, in thy most mysterious recess, where the vapour is rose-coloured, and the bright rainbow alone now forms the bridge from the Iris Rock! 1849 Bonnycastle

I was so disgusted to see the spirit of pelf, that concentration of self, hovering over one of the last of the wonders of the world, that I rushed to the Three Horse Railway, and soon forgot all my misery in scrambling for a place; there was no alternative. There were only three carriages and one open cart on the rail; the three aristocratic conveniences were full; and the coal-box — for it looked very like one — was full also, of loafers and luggage; so I despaired of quitting the Falls almost as much, by way of balance, as I rejoiced when they once again met my ken.

1850

HOUSTON, *Mrs.* M. C. Hesperos; or, Travels in the west. Lond.: Parker. 1850. 1:122–139. 1850 Houston

The author, who laments the nearness of the town, would have the Falls and scenery "one glorious natural temple, dedicated to the God who formed it from the foundation of the world," and all artificial structures hurled into the rapids.

1853

CHAMBERS, WILLIAM. Things as they are in America. Lond. and Edinb.: William and Robert Chambers. 1854. Pp. 102–112. 1853 Chambers

In thinking of this marvellous work of nature, it is unfortunate that the mind is disturbed by mean associations connected with the works of man. On the British side, it is environed by a series of paltry curiosity-shops; and there, at the ledge on which I had seated myself, a labourer was busied in wheeling rubbish into the cataract. On the American side, runs of water have been led off to move the machinery of a saw and paper mill; and at

1853 Chambers

present there is a proposition before the world to turn the whole force of the river to profitable account in some kind of mechanical processes! Why, of all conceivable names, Manchester should have been selected for the village, or infant city, now in the course of erection near the American fall, it would be difficult to understand on any other principle than that of imparting a manufacturing character to the spot.

Manchester, if it must be so called, consists of several streets in skeleton, with a large railway-station in the centre, and a number of hotels stuck about for the accommodation of visitors.

1853 Kingston

KINGSTON, WILLIAM H. G. Western wanderings; or, A pleasure tour in the Canadas. Lond.: Chapman and Hall. 1856. 1:265–311.

In his general description the author takes occasion to express his opinions of the unsightly and " incongruous buildings " about the Falls.

As soon as our luggage was arranged, the porters dismissed, our dresses dusted, and our hands washed, we opened the Venetian blinds with reverential awe, and stepped out together into the broad verandah, where a full and perfect view of the Falls appeared before our eyes. There were the very waters on which for days past we had floated, so calm and placid generally, now leaping, foaming, spouting, and dashing over a lofty cliff, from a wide and liquid plain, about level with our eyes, and plunging into a deep chasm far down below our feet. We were, however, very much more struck with the beautiful and picturesque view than with the grandeur of the spectacle, so totally different to what all prints, sketches, and models, had led us to expect. We were delighted with the form of the cliffs, the varied tints of the trees, the unique combination of wood and water, but we were not overwhelmed with awe. The roar even was neither loud nor deep, nor was it necessary to speak at all in a higher key than usual to make ourselves heard. Every now and then an eddy of wind would bring a light shower of spray towards us, to prove to us the reality of the waterfall. Even in spite of this, our feeling was for some time, till we had gone over, and under,

Rapids above the Falls

and on either side, and touched the foaming waters of the cataract, that we were gazing on some strange and wonderful picture rather than on an actual object in nature. My wish is to make my readers understand what Niagara really is, as far as pen and pencil can do so, rather than to fly into ecstatic raptures and to utter oft-repeated notes of admiration on its grandeur and sublimity, or to enlarge on our own sensations of wonder and awe. 1853 Kingston

. . . . .

An excellent road runs along the top of the cliff, as far as the end of the Horseshoe Fall, and along this we bent our steps. . . .

. . . The road we took is lined with a collection of museums, curiosity shops, refreshment booths, and raree-shows, where guides and cicerones congregate; but fortunately, as the season was over, most of the tribe had taken their departure, and we were but little persecuted by their offers of service. A number of Chinese pagoda-looking edifices and other incongruous buildings have been erected on the Canada bank, and others are rearing their ill-shaped forms wherever a spot can be found whereon to perch them. But it matters little; the puny efforts and bad taste of man, in his attempt to adorn nature, can do little towards spoiling Niagara. Its might and majesty can scarcely be blemished by his Lilliputian efforts

. . . . .

October the 8th was a lovely day, and late as was the period of year, the air still retained the genial warmth of summer, at the same time that it was pleasantly mixed with the briskness and freshness of autumn. Not to give cause of offense to the American side of Niagara, we had determined to devote the forenoon to an inspection of its beauties; as soon, therefore, as breakfast was over, with waterproof cloaks on our arms, we descended by the winding-road which leads down the cliff from the hotel to the ferry directly facing the American Fall.

1853
Kingston

The bank on our right was covered with the richest foliage of every tree, from the deepest red to the faintest yellow, and with every variety of green and brown which Nature's brush can produce. Beyond this highly-coloured framework were seen the Falls, with their green and blue and whitened waters. A neat, well-built boat, about sixteen feet in length, lay drawn up on the rocky beach. In attendance on her stood a most uncouth-looking lad, whittling to keep his fingers from being idle. As we gazed at the white mass of raging foam hurtling down the cliff before us, and the whirling, eddying waters which must be crossed before we could reach the opposite shore, we felt that had we not seen the same slight lad rowing backwards and forwards many times in the day, we should have hesitated long indeed before we had ventured within the power of their fearful vortex.

. . . . . .

. . . A back eddy enabled us to get up the stream towards the great fall without difficulty, and then thrusting forth into it, we were whirled downwards again many fathoms in the direction of the whirlpool; while clouds of spray, driven by the wind from both falls, showered down upon our waterproofs, till we looked as if we had been diving under the very cataracts themselves. Our surly Charon pulled right sturdily across the troubled tide, when, much to our satisfaction, another eddy caught our boat, and took us up to a rough stage at the foot of a perpendicular cliff, up which it was difficult to discover how we should manage to ascend. It was grand to look upwards through the mist, for not fifty yards from our heads came thundering down the American cataract, with a fury which made us content not to approach it nearer. The boat was now urged up a slide, and landing in a dense shower of spray, we found ourselves at the foot of a long wooden tunnel, with a railway and a flight of steps within it leading to the top of the cliff. As we had no fancy to perform a labour which would be looked on as a highly satisfactory penance by a pious Romanist, we took our seats in a car; and a bell being rung by our boatman, we were speedily drawn upwards into the

interior of a large shed, which we found stood on the summit of the cliff. Dismounting, we paid sixpence to a man who, pointing to a door, said, "There are the Falls." 1853 Kingston

The show-like look of the place, and the man's indifferent tone, were dreadfully unromantic, and almost made us fancy that we were going to see a painted panorama instead of the reality. However, on passing through a garden, and finding ourselves on the very edge of the Fall, we instantly forgot the vulgar method by which we had reached the spot. In a succession of the wildest foaming billows the waters come rushing down a steeply-inclined plane, till they glide in a compact mass over the cliff, where they burst instantly into sheets of foam.

Passing along the edge of these whirling, giddying rapids, we crossed a small stream, a modest contribution to the waters of Niagara; then through a lumber-yard, belonging to one of many saw-mills with which the American Falls are adorned; and finally taking the way over a long wooden bridge to the right, thrown from rock to rock, we crossed the very rapids themselves to Goat Island. Looking upwards from the centre of this bridge, the spectacle is indeed curious. From so much greater a height do the waters of the rapids come than that on which we were standing, making it impossible to see the land beyond them, that literally they seem to be leaping, rolling, and tumbling, in long wreaths of foam out of the sky itself. On our left, bordering the river, were flourishing rows of saw, corn, cotton, and paper mills; while others, in their lust of gain, had boldly encroached into the very rapids themselves. Truly Jonathan has made good use of the unrivalled water-power at his disposal; though we, in our romantic mood, felt a high-souled contempt for the sordid minds which can make Niagara turn their mill-wheels on the very verge of his own cataracts, like a captive prince chained to mean labour in the palace of his fathers. We were glad that the Canadian side was free from such incongruous ornaments, but we agreed not to make too minute inquiries as to the cause. The pagodas and temples,

1853 Kingston

eating-booths and museums, show that refined taste has not much to do with the matter.

. . . . .

The first bridge ends in a small island decorated with a pavilion, containing Indian curiosities, walking-canes, and refreshments, as also the residence of the custos of Goat Island, to whom, by payment of one shilling for each person, we were made free of the insular territory, the property of a private individual, during our stay in the neighbourhood. Behind the pavilion a little wooden bridge led us to another small island, on which grow several writhing twisted cedars. Hence the rapids appeared even to greater advantage than from the bridge; and more terror-inspiring, for, rushing towards us, they seemed about to sweep the plot of ground and our own precious persons to destruction over the Falls. Another stout plank-bridge, passable also for carriages, carried us over the rapids to Goat Island; in which, by keeping to the right, we discovered every point of interest without difficulty, and free from the tiresome race of guides.

We followed the shore of the island some way, bordering the rapids, till, descending a flight of steps in the bank, we found ourselves close to Young America [the Central Fall], with a magnificent view down the river, terminated by the suspension-bridge, including the larger American fall on one side, and the Clifton House, an object of no little interest, on the other.

Crossing Young America by a wide plank, we stood on a little island, or rock, not ten yards in circumference, with a roaring cataract on either side of it. As we saw the foaming water rushing round us, it required no little mental exertion to recollect that, as probably the rock on which we rested had there remained for centuries, we need be under no immediate alarm of its being hurled down over the cliff before we could escape from it.

. . . . .

Returning up the steps, we continued along the top of the cliffs till we came before a most picturesque view of the Horseshoe

Fall, with a fine foreground of richly tinted trees on broken banks, and the frothy stream below, while the little tower came in appropriately on the left overlooking the cataract. The whole island is beautifully wooded with a great variety of trees, and is as romantic and interesting a spot as the most enthusiastic of meditative poets could desire. 1853 Kingston

. . . . .

Descending a winding path, we reached the south end of the Horseshoe Fall, where a wooden bridge, some forty yards long, or more, resting on a succession of small rocks parallel with the very brink of the Fall; but three or four feet from it carried us to the foot of the little tower, whence we ascended a spiral stair to a platform on its summit, surrounded by a light iron railing literally overhanging the great cataract itself. Here the sight is grand and awe-inspiring. We stood where thousands had stood before; but, as we looked up the river at the wide-spreading rapids, and watched the fiercely-foaming mass come rushing down towards our resting-place, and whirling under our feet, then taking its tremendous plunge down into the caldron on the brim of which we stood, and sending up clouds of vapour which kept circling round our heads, already somewhat confused by the din and roar, a more than usual exertion of mind was required to feel the reality of the security we were enjoying. Not that we experienced anything akin to fear, more than the trained soldier does in the raging battle-field. After we had encountered the first shock of this novel existence, though the wind blew strong round the tower — though the frail fabric shook beneath our feet — though the whirling spray blinded our eyes, and the roar of the cataract — for here indeed it did roar — almost deprived us of the sense of hearing, such only tended to excite and strengthen our nerves, all other feelings were absorbed in the wild grandeur of the scene.

. . . . .

1853
Kingston

In the evening we took a stroll, by the pale light of a young moon, to Table Rock, where we stood indelibly impressing on our minds the scene before us. Beautiful and grand as it is, I cannot at all enter into the feelings of those (supposing people to feel as they write) who speak of Niagara as showing the greatness and power of the Almighty; who describe it as drawing them nearer to heaven by its sublimity, and talk of it as impressing them with a sense of the insignificance of man, the littleness of human affairs, and very much in a similar strain. Such terms, we agreed, are not only inappropriate and often ridiculous, but approaching even to blasphemous. The creative power of the Almighty is shown as much in the smallest of the creatures which crawl the earth as in the largest animal which has life; and it appears to me, that instead of fancying we hear His voice in the roar of the cataract, in the rattling of the thunder, in the raging of the tempest on the billowy ocean, we might rather consider, on such occasions, He has thought fit to relax His omnipotence over the elements. Justly we may pray to Him for aid against the injuries they may inflict; but, looking on Him as we ought as a God of mercy and love, we cannot associate strife, and tumult, and disorder, with His attributes. Surely He created rivers to irrigate the land and to afford easy means of communication to those dwelling on it. Niagara is an exception to the ordinary rule. It was allowed to exist, perhaps, as an ornament on the face of nature, or to test the ingenuity of man to counteract the impediment offered to the free navigation of those inland seas. It is no wonder, surely. A poet may describe it as his fervent imagination may dictate, but, in earnest unexaggerated prose, it consists simply of a good-sized river falling over a very ordinary-sized cliff, and very, very inferior in grandeur or in terror-inspiring power to a storm on the ocean when lightnings dart from the lowering sky, the wind howls, and the waves, lashed to fury, threaten the labouring ship. Let us give Niagara its due. It is a very beautiful sight, and more worthy of a visit than most sights

(though defend me from living long near it), and Cousin Jonathan finds it very useful for turning his mills, and it has afforded ample amusement for sketchers, and will afford subjects for the painter's brush as long as the world lasts. 1853 Kingston

We crossed again the next morning to Goat Island. . . .

We stood long in a shower of spray, watching a magnificent iris formed on the mist rising from the American fall. . . . Then we went to the top of the tower, once again looked into the foaming caldron, got almost drenched with the dense white showers which came flying over, and looked at a still more beautiful and curious iris. Three portions of a bow appeared on as many different clouds of spray, altogether forming an entire bow. The part on the left was formed on the spray of the great Fall, the centre on that of the American Fall, and the right on that which ascends from the water projected to the right of the tower close to Goat Island. Dark clouds gathering rapidly in the west gave a more purely malachite tint to the edge of the Falls, and brought out the white foam in greater relief, so, warned by the signs of approaching rain, we hurried home. It came in a pelting shower, but after dinner we were able to pay a visit to Table Rock, when we watched a number of wild fowl sporting on the edge of the Fall. Now and then one would pitch on the hurtling waters, when down it would be carried amidst the mass of foam; but, though we narrowly watched several thus treated, we could not discover whether they ever again rose, or were destroyed in the vortex below. Others were flying rapidly backwards and forwards in the mist, seeming to enjoy themselves, though I have some doubts whether they were not more frightened than amused. The boys in the ferry-boats shot those within their reach, and several of the slain were floating in the eddy. Our young Charon requested leave to pull off into the very centre of the boiling current in order to pick up one he had just killed, on which proceeding, however, I put my veto till we were safe out of his boat.

1853 Moodie

MOODIE, *Mrs.* SUSANNA STRICKLAND. Life in the clearings. Lond.: R. Bentley. 1853. Pp. 330–371.

A sympathetic description of the beauties of Niagara, interspersed with bits about people and hotel gossip.

"Chained to the spot,
Mute with admiration."

The removal of all the ugly mills along its shores would improve it, perhaps, and add the one charm it wants, by being hemmed in by tasteless buildings,— the sublimity of solitude.

Oh, for one hour alone with nature, and her great masterpiece Niagara! What solemn converse would the soul hold with its Creator at such a shrine, and the busy hum of practical life would not mar with its discord this grand "thunder of the waters!" Realities are unmanageable things in some hands, and the Americans are gravely contemplating making their sublime Fall into a motive power for turning machinery.

Ye Gods! What next will the love of gain suggest to the gold-worshippers? The whole earth should enter into a protest against such an act of sacrilege — such a shameless desecration of one of the noblest works of God.

Niagara belongs to no particular nation or people. It is an inheritance bequeathed by the great Author to all mankind,— an altar raised by his own almighty hand,— at which all true worshippers must bow the knee in solemn adoration. I trust that these free glad waters will assert their own rights, and dash into mist and spray any attempt made to infringe their glorious liberty.

1853 Murray

MURRAY, AMELIA M. Letters from the United States, Cuba, and Canada. New York: Putnam & Co. 1856. Pp. 109–115.

The author is impressed by the exorbitant fees charged at Niagara.

The English are accused of being a grasping nation in requiring fees for sights, but nothing I ever met with equals the charges for the contemplation of Nature here. The possessor of Goat Island makes one thousand pounds a year of those strangers or visitors who land on its shores; but this day we were actually

charged one shilling each for only going into the wood, from whence a good view of the whirlpool can be obtained! As ground is becoming of great value in this neighbourhood, it may be necessary to require payment for keeping any part of it free from the desecration of taverns and saw-mills; but a more moderate fee would answer better to the proprietors, and not act as a prohibition to a large class who have not many spare shillings in their pockets. . . . It is certainly worth crossing the Atlantic for Niagara alone. 1853 Murray

NEW YORK (STATE) LEGISLATURE. An act to incorporate the Niagara river hydraulic company. (Laws of 1853, chap. 116.) 1853 New York Legislature

The act passed, April, 1832, creates the corporation, gives the name and powers of the corporations, and makes general provisions thereof.

WELD, CHARLES RICHARD. A vacation tour in the United States and Canada. Lond.: Longman, Brown, Green, and Longmans. 1855. Pp. 159–179. 1853 Weld

The author visited the Falls 55 years after his half-brother Isaac Weld. He gives a good description of all the points of interest at the Falls. He viewed them at dusk, in the morning and by moonlight.

The scene (from Brock's monument) towards the Falls is very remarkable, consisting principally of a boundless expanse of table-land covered by a dense forest, through which the river has cut a passage. Of the falls themselves, seven miles distant, not a trace is visible; and the dark-blue waters of the great river flow so smoothly at the bottom of the deep gorge, as to give no idea of their having passed over a mighty precipice. . . .

. . . Resuming my seat, I drove along a sandy road through the partially-cleared bush, my excitement increasing as the distance to the falls diminished. When about three miles from them, I ordered the driver to stop; and as soon as the carriage ceased to move, a deep booming noise was heard, issuing from the depth of the forest. It was the eternal voice of the falls. My impatience increased, but it found no sympathy in my young Yankee driver, who, "guessing" he had driven hundreds of

1853
Weld

people to the Clifton House, treated my proceedings with perfect indifference. As all things, however, come to an end, so did the drive. At the end of seven miles the road, hitherto level, suddenly dipped, and I beheld immediately before me the mighty cataracts, illuminated by brilliant sunshine. To the question "Were you disappointed by the first view?" which is generally asked, I answer "No;" but it is right to add, I had been careful not to raise my expectations too high. Indeed, remembering how many persons have expressed themselves disappointed by the height of the falls appearing so insignificant in proportion to their great breadth, I had dwarfed my ideal view too much; and now, when the reality was before me, it exceeded my expectations. This was a pleasing disappointment. . . . With an alacrity which made the numerous drivers surrounding the hotel aware I had just arrived, hastened to the Table Rock. To my surprise, beyond the mere offer of their vehicles, I was left to pursue my way unmolested; and I have to add, that during my abode at the falls, I was never annoyed in any way by guides; nor, indeed, did I see any persons practising the generally officious and to the tourist distressing office of showman. I mention this, because I have frequently seen and heard it asserted, that the visitor at Niagara is sorely plagued by guides, who start up at all points to the distraction of his peace and enjoyment. A walk — or rather a run — of a few minutes brought me to the Table Rock; from whence I gazed on the descending sea before me with feelings of awe and wonder, tempered by a feeling of gratitude that I was permitted to look upon a scene whose stupendous majesty is identified with my earliest knowledge of the wonders of the world.

. . . . .

How long I remained spell-bound to the spot where I had seated myself, I know not; but as a proof of the entire concentration of all senses on the scene, I was entirely ignorant of the fact that I had been sitting some time in a pool of water formed by the spray.

. . . . .

. . . I spent an entire day on Goat Island, happily left in its primeval state of wildness. From this lovely isle . . . endless views of the two falls are obtained. That of the Horseshoe Cataract from the gallery of the Terrapin Tower is the most imposing. Here you look upon the long water-curve of exquisite green, forming the lip of the fall, which in the most concave part is said to be twenty feet thick, and down into the abyss boiling with mist and foam. The solemn and slow majesty of the descent of the water is very remarkable, presenting vast green curtain-like folds, from which burst globes of compressed air. The prodigious quantity of mist and spray renders the bottom invisible, and gives infinite variety to the scene, which, when lighted by the play of innumerable vivid rainbows, possesses a witching beauty unsurpassed and unequalled. 1853 Weld

A flock of large gulls were sporting amidst these quivering hues, rejoicing in their power; now dashing downwards until lost in the blinding spray, now soaring aloft in the deep blue heavens. Amidst such sights and sounds, it was an inexpressible relief to find the horrible American creation of "Manchester," with its cotton mills, does not yet destroy the magnificence of the American cataract. The present buildings are far above the fall, but it may be, that triumphing over all difficulties — for there are none too formidable to check Yankee enterprise — the rapids on the verge of the descent may be made to do cotton-spinning duty, and the fall itself be diverted into innumerable mill-dams. Already numerous daring projects are contemplated to "use up the almighty water privilege" of Niagara, which is stated to exceed in power the entire steam force employed to drive machinery in Great Britain; but as half the falls belong to England, it is to be hoped the Horseshoe Cataract is not included in the scheme. I could not help wishing that the influence which will, I trust, prevent any attempt to perpetrate such barbarity, would sweep away the frippery curiosity-shops and museums now deforming the Canadian side of the river.

1853
Weld

Far different was the vicinity of Niagara at the time of my brother's visit. Dense woods then occupied the banks. Not a house was near; and on one occasion the provisions which his party had concealed were stolen by the Indians, who resided at Niagara for the sake of feeding on the wild animals which were precipitated over the falls.

. . . . .

On the last morning of my sojourn at the falls, anxious to see as much of them as possible, I rose before the sun. On looking out, the landscape was still dim, but towering high above the Great Fall rose the column of mist, crested by a roseate hue. The effect was enchanting. Not a cloud obscured the heavens; and so tranquil was the air, that the vapour-pillar seemd a gigantic shaft of white marble surmounted by a rose-coloured capital. A friend, whom I called to witness the beautiful spectacle, agreed with me that the column was at least 800 feet high. I no longer doubted that a faint cloud to which my attention had been drawn when standing on the roof of the Court House at Toronto, was the mist over Niagara. The distance is fifty miles, but it has been seen farther off.

As the sun ascended, the pillar became more rose-hued; presently the crest of the falls caught the glowing tints, and the rushing waters were a sheet of burnished gold.

. . . . .

A brisk trade in Indian ornaments and curiosities is carried on at Niagara. Daguerreotypes of the American fall are in great request; the proper thing, according to Yankee notions, being for the purchaser to stand prominently in the foreground while the impression is taken. Until I visited Niagara, I was at a loss to understand why all daguerreotype views should generally represent the American fall; but the ground is so violently agitated on the Canadian side as to render the operation of the camera extremely unsatisfactory,— at least all the results I saw were very poor. Recent improvements in photography will, however, I have no doubt, give better effects.

1859

ENGLEHEART, GARDNER D. Journal of the progress of H. R. H. the Prince of Wales through British North America; and his visit to the United States, 10th July to 15th November, 1860. Privately printed. (1860.) Pp. 63–66. 1859 Engleheart

A brief journal of three days spent at the Falls and in their vicinity. A view of the Falls from Goat Island shows the tower and the angle of the Horseshoe Fall.

1871

JAMES, HENRY. Niagara. 1871. (*In his* Portraits of places. Boston. Osgood. 1884. Pp. 364–376.) 1871 James

This paper was originally published in the *Nation*.

My journey hitherward by a morning's sail from Toronto across Lake Ontario, seemed to me, as regards a certain dull vacuity in this episode of travel, a kind of calculated preparation for the uproar of Niagara — a pause or hush on the threshold of a great impression; and this, too, in spite of the reverent attention I was mindful to bestow on the first seen, in my experience, of the great lakes. It has the merit, from the shore, of producing a slight ambiguity of vision. It is the sea, and yet just not the sea. The huge expanse, the landless line of the horizon, suggest the ocean; while an indefinable shortness of pulse, a kind of fresh-water gentleness of tone, seem to contradict the idea. What meets the eye is on the scale of the ocean, but you feel somehow that the lake is a thing of smaller spirit. Lake-navigation, therefore, seems to me not especially entertaining. The scene tends to offer, as one may say, a sort of marine-effect missed. It has the blankness and vacancy of the sea, without that vast essential swell which, amid the belting brine, so often saves the situation to the eye. I was occupied, as we crossed, in wondering whether this dull reduction of the main contained that which could properly be termed " scenery." At the mouth of the Niagara River, however, after a sail of three hours, scenery really begins, and very soon crowds upon you in force. The steamer puts into the narrow

1871
James

channel of the stream, and heads upward between high embankments. From this point, I think, you really enter into relations with Niagara. Little by little the elements become a picture, rich with the shadow of coming events. You have a foretaste of the great spectacle of colour which you enjoy at the Falls. The even cliffs of red-brown earth are crusted and spotted with autumnal orange and crimson, and, laden with this gorgeous decay, they plunge sheer into the deep-dyed green of the river. As you proceed, the river begins to tell its tale — at first in broken syllables of foam and flurry, and then, as it were, in rushing, flashing sentences and passionate ejaculations. Onwards from Lewiston, where you are transferred from the boat to the train, you see it from the edge of the American cliff, far beneath you, now superbly unnavigable. You have a lively sense of something happening ahead: the river, as a man near me said, has evidently been in a row. The cliffs here are immense: they form a *vomitorium* worthy of the living floods whose exit they protect. This is the first act of the drama of Niagara: for it is, I believe, one of the commonplaces of description, that you instinctively convert it into a series of "situations." At the station pertaining to the railway suspension-bridge, you see in mid-air, beyond an interval of murky confusion produced at once by the farther bridge, the smoke of the trains, and the thickened atmosphere of the peopled bank, a huge far-flashing sheet which glares through the distance as a monstrous absorbent and irradiant of light. And here, in the interest of the picturesque, let me note that this obstructive bridge tends in a way to enhance the first glimpse of the cataract. Its long black span, falling dead along the shining brow of the Falls, seems shivered and smitten by their fierce effulgence, and trembles across the field of vision like some enormous mote in a light too brilliant. A moment later, as the train proceeds, you plunge into the village, and the cataract, save as a vague ground-tone to this trivial interlude, is, like so many other goals of aesthetic pilgrimage, temporarily postponed to the hotel.

With this postponement comes, I think, an immediate decline of expectation; for there is every appearance that the spectacle you have come so far to see is to be choked in the horribly vulgar shops and booths and catch-penny artifices which have pushed and elbowed to within the very spray of the Falls, and ply their importunities in shrill competition with its thunder. You see a multitude of hotels and taverns and stores, glaring with white paint, bedizened with placards and advertisements, and decorated by groups of those gentlemen who flourish most rankly on the soil of New York and in the vicinage of hotels; who carry their hands in their pockets, wear their hats always and every way, and, although of a stationary habit, yet spurn the earth with their heels. A side-glimpse of the Falls, however, calls out your philosophy; you reflect that this may be regarded as one of those sordid foregrounds which Turner liked to use, and which may be effective as a foil; you hurry to where the roar grows louder, and, I was going to say, you escape from the village. In fact, however, you don't escape from it; it is constantly at your elbow, just to the right or the left of the line of contemplation. It would be paying Niagara a poor compliment to say that, practically, she does not hurl away this chaffering by-play from her edge; but as you value the integrity of your impression, you are bound to affirm that it suffers appreciable abatement from such sources. You wonder, as you stroll about, whether it is altogether an unrighteous dream that with the slow progress of taste and the possible or impossible growth of some larger comprehension of beauty and fitness, the public conscience may not tend to confer upon such sovereign phases of nature something of the inviolability and privacy which we are slow to bestow, indeed, upon fame, but which we do not grudge at least to art. We place a great picture, a great statue, in a museum: we erect a great monument in the centre of our largest square, and if we can suppose ourselves nowadays to build a cathedral, we should certainly isolate it as much as possible and expose it to no ignoble contact. We cannot enclose Niagara with walls and a roof, nor girdle it with a palisade; but

1871 James

1871 James

the sentimental tourist may muse upon the contingency of its being guarded by the negative homage of empty spaces and absent barracks and decent forbearance. The actual abuse of the scene belongs evidently to that immense class of iniquities which are destined to grow very much worse in order to grow a very little better. The good humour engendered by the main spectacle bids you suffer it to run its course.

Though hereabouts so much is great, distances are small, and a ramble of two or three hours enables you to gaze hither and thither from a dozen standpoints. The one you are likely to choose first is that on the Canada cliff, a little way above the suspension-bridge. The great fall faces you, enshrined in its own surging incense. The common feeling just here, I believe, is one of disappointment at its want of height; the whole thing appears to many people somewhat smaller than its fame. My own sense, I confess, was absolutely gratified from the first; and, indeed, I was not struck with anything being tall or short, but with everything being perfect. You are, moreover, at some distance, and you feel that with the lessening interval you will not be cheated of your chance to be dizzied with mere dimensions. Already you see the world-famous green, baffling painters, baffling poets, shining on the lip of the precipice; the more so, of course, for the clouds of silver and snow into which it speedily resolves itself. The whole picture before you is admirably simple. The Horseshoe glares and boils and smokes from the centre to the right, drumming itself into powder and thunder; in the centre the dark pedestal of Goat Island divides the double flood; to the left booms in vaporous dimness the minor battery of the American Fall; while on a level with the eye, above the still crest of either cataract, appear the white faces of the hithermost rapids. The circle of weltering froth at the base of the Horseshoe, emerging from the dead white vapours — absolute white, as moonless midnight is absolute black — which muffle impenetrably the crash of the river upon the lower bed, melts slowly into the darker shades of green. It seems in itself a drama of thrilling interest, this

blanched survival and recovery of the stream. It stretches away like a tired swimmer, struggling from the snowy scum and the silver drift, and passing slowly from an eddying foam-sheet, touched with green lights, to a cold, verd-antique, streaked and marbled with trails and wild arabesques of foam. This is the beginning of that air of recent distress which marks the river as you meet it at the lake. It shifts along, tremendously conscious, relieved, disengaged, knowing the worst is over, with its dignity injured but its volume undiminished, the most stately, the least turbid of torrents. Its movement, its sweep and stride, are as admirable as its colour, but as little as its colour to be made a matter of words. These things are but part of a spectacle in which nothing is imperfect. As you draw nearer and nearer, on the Canada cliff, to the right arm of the Horseshoe, the mass begins in all conscience to be large enough. You are able at last to stand on the very verge of the shelf from which the leap is taken, bathing your boot-toes, if you like, in the side-ooze of the glassy curve. I may say, in parenthesis, that the importunities one suffers here, amid the central din of the cataract, from hackmen and photographers and vendors of gimcracks, the simply hideous and infamous. The road is lined with little drinking-shops and warehouses, and from these retreats their occupants dart forth upon the hapless traveller with their competitive attractions. You purchase release at last by the fury of your indifference, and stand there gazing your fill at the most beautiful object in the world.

1871 James

The perfect taste of it is the great characteristic. It is not in the least monstrous; it is thoroughly artistic and, as the phrase is, thought out. In the matter of line it beats Michael Angelo. One may seem at first to say the least, but the careful observer will admit that one says the most, in saying that it *pleases* — pleases even a spectator who was not ashamed to write the other day that he didn't care for cataracts. There are, however, so many more things to say about it — its multitudinous features crowd so upon the vision as one looks — that it seems absurd to begin to analyse.

1871
James

The main feature, perhaps, is the incomparable loveliness of the immense line of the shelf and its lateral abutments. It neither falters, nor breaks nor stiffens, but maintains from wing to wing the lightness of its semicircle. This perfect curve melts into the sheet that seems at once to drop from it and sustain it. The famous green loses nothing, as you may imagine, on a nearer view. A green more vividly cool and pure it is impossible to conceive. It is to the vulgar greens of earth what the blue of a summer sky is to artificial dyes, and is, in fact, as sacred, as remote, as impalpable as that. You can fancy it the parent-green, the head-spring of colour to all the verdant water-caves and all the clear, subfluvial haunts and bowers of naiads and mermen in all the streams of the earth. The lower half of the watery wall is shrouded in the steam of the boiling gulf — a veil never rent nor lifted. At its heart this eternal cloud seems fixed and still with excess of motion — still and intensely white; but, as it rolls and climbs against its lucent cliff, it tosses little whiffs and fumes and pants of snowy smoke, which betray the convulsions we never behold. In the middle of the curve, the depth of the recess, the converging walls are ground into a dust of foam, which rises in a tall column, and fills the upper air with its hovering drift. Its summit far overtops the crest of the cataract, and, as you look down along the rapids above, you see it hanging over the averted gulf like some far-flowing signal of danger. Of these things some vulgar verbal hint may be attempted; but what words can render the rarest charm of all — the clear-cut brow of the Fall, the very act and figure of the leap, the rounded passage of the horizontal to the perpendicular? To say it is simple is to make a phrase about it. Nothing was ever more successfully executed. It is carved as sharp as an emerald, as one must say and say again. It arrives, it pauses, it plunges; it comes and goes for ever; it melts and shifts and changes, all with the sound as of millions of bass-voices; and yet its outline never varies, never moves with a different pulse. It is as gentle as the pouring of wine from a flagon — of melody

from the lip of a singer. From the little grove beside the American Fall you catch this extraordinary profile better than you are able to do at the Horseshoe. If the line of beauty had vanished from the earth elsewhere, it would survive on the brow of Niagara. It is impossible to insist too strongly on the grace of the thing, as seen from the Canada cliff. The genius who invented it was certainly the first author of the idea that order, proportion and symmetry are the conditions of perfect beauty. He applied his faith among the watching and listening forests, long before the Greeks proclaimed theirs in the measurements of the Parthenon. Even the roll of the white batteries at the base seems fixed and poised and ordered, and in the vague middle zone of difference between the flood as it falls and the mist as it rises you imagine a mystical meaning — the passage of body to soul, of matter to spirit, of human to divine. 1871 James

Goat Island, of which every one has heard, is the menagerie of lions, and the spot where your single stone — or, in plain prose, your half-dollar — kills most birds. This broad insular strip, which performs the excellent office of withholding the American shore from immediate contact with the flood, has been left very much to itself, and here you may ramble, for the most part, in undiverted contemplation. The island is owned, I believe, by a family of co-heirs, who have the good taste to keep it quiet. More than once, however, as I have been told, they have been offered a " big price " for the privilege of building an hotel upon this sacred soil. They have been wise, but, after all, they are human, and the offer may be made once too often. Before this fatal day dawns, why should not the State buy up the precious acres, as California has done the Yo-Semite? It is the opinion of a sentimental tourist that no price would be too great to pay. Otherwise, the only hope for their integrity is in the possibility of a shrewd provision on the part of the gentlemen who know how to keep hotels that the music of the dinner-band would be injured by the roar of the cataract. You approach from Goat Island the left abutment of the Horseshoe. The little tower which, with the

1871
James

classic rainbow, figures in all " views " of the scene, is planted at a dozen feet from the shore, directly on the shoulder of the Fall. This little tower, I think, deserves a compliment. One might have said beforehand that it would never do, but, as it stands, it makes rather a good point. It serves as a unit of appreciation of the scale of things, and from its spray-blackened summit it admits you to an almost downward peep into the green gulf. More here, even, than on the Canada shore, you perceive the unlimited *wateriness* of the whole spectacle. Its liquid masses take on at moments the likeness of walls and pillars and columns, and, to present any vivid picture of them, we are compelled to talk freely of emerald and crystal, of silver and marble. But really, all the simplicity of the Falls, and half their grandeur, reside in their unmitigated fluidity, which excludes all rocky staging and earthy commixture. It is water piled on water, pinned on water, hinging and hanging on water, breaking, crashing, whitening in shocks altogether watery. And yet for all this no solid was ever so solid as that sculptured shoulder of the Horseshoe. From this little tower, or, better still, from various points farther along the island-shore, even to look is to be immersed. Before you stretches the huge expanse of the upper river, with its belittled cliffs, now mere black lines of forest, dull as with the sadness of gazing at perpetual trouble, eternal danger. Anything more horribly desolate than this boundless livid welter of the rapids it is impossible to conceive, and you very soon begin to pay it the tribute of your own suddenly-assumed suspense, in the impulse to people it with human forms. On this theme you can work out endless analogies. Yes, they are alive, every fear-blanched billow and eddy of them — alive and frenzied with the sense of their doom. They see below them that nameless pause of the arrested current, and the high-tossed drift of sound and spray which rises up lamenting, like the ghosts of their brothers who have been dashed to pieces. They shriek, they sob, they clasp their white hands and toss their long hair; they cling and clutch and wrestle, and above all, they appear to *bite*. Especially tragical is the air they

have of being forced backward, with averted faces, to their fate. 1871
Every pulse of the flood is like the grim stride of a giant, wading James
huge-kneed to his purpose, with the white teeth of a victim fastened in his neck. The outermost of three small islands, interconnected by short bridges, at the extremity of this shore, places one in singularly intimate relation with this portentous flurry. To say that hereabouts the water leaps and plunges and rears and dives, that its uproar makes even one's own ideas about it inaudible, and its current sweeps those ideas to perdition, is to give a very pale account of the universal agitation.

The great spectacle may be called complete only when you have gone down the river some four miles, on the American side, to the so-called rapids of the Whirlpool. Here the unhappy stream tremendously renews its anguish. Two approaches have been contrived on the cliff — one to the rapids proper, the other, farther below, to the scene of the sudden bend. The first consists of a little wooden cage, of the " elevator " pattern, which slides up and down a gigantic perpendicular shaft of horrible flimsiness. But a couple of the usual little brides, staggering beneath the weight of gorgeous cashmeres, entered the conveyance with their respective consorts at the same time with myself; and, as it thus carried Hymen and his fortunes, we survived the adventure. You obtain from below — that is, on the shore of the river — a specimen of the noblest cliff-scenery. The green embankment at the base of the sheer red wall is by itself a very fair example of what they call in the Rocky Mountains a foot-hill; and from this continuous pedestal erects itself a bristling palisade of earth. As it stands, Gustave Doré might have drawn it. He would have sketched with especial ardour certain parasitical shrubs and boskages — lone and dizzy witnesses of autumn; certain outward-peering wens and warts and other perpendicular excrescences of rock; and, above all, near the summit, the fantastic figures of sundry audacious minor cliffs, grafted upon the greater by a mere lateral attachment and based in the empty air, with great slim

1871
James

trees rooted on their verges, like the tower of the Palazzo Vecchio at Florence. The actual whirlpool is a third of a mile farther down the river, and is best seen from the cliff above. From this point of view, it seems to me by all odds the finest of the secondary episodes of the drama of Niagara, and one on which a scribbling tourist, ineffectively playing at showman, may be content to ring down his curtain. The channel at this point turns away to the right, at a clean right-angle, and the river, arriving from the rapids just above with stupendous velocity, meets the hollow elbow of the Canada shore. The movement with which it betrays its surprise and bewilderment — the sudden issueless maze of waters — is, I think, after the Horseshoe Fall, the very finest thing in its progress. It breaks into no small rage; the offending cliffs receive no drop of spray; for the flood moves in a body and wastes no vulgar side-spurts; but you see it shaken to its innermost bowels and panting hugely, as if smothered in its excessive volume. Pressed back upon its centre, the current creates a sort of pivot, from which it eddies, groping for exit in vast slow circles, delicately and irregularly outlined in foam. The Canada shore, shaggy and gaudy with late September foliage, closes about it like the rising shelves of an amphitheatre, and deepens by contrast the strong blue-green of the stream. This slow-revolving surface — it seems in places perfectly still — resembles nothing so much as some ancient palace-pavement, cracked and scratched by the butts of legionary spears and the gold-stiffened hem of the garments of kings.

1871
Macaulay

MACAULAY, JAMES. Across the ferry; first impressions of America and its people. Lond.: Hodder and Stoughton. 1871. Pp. 186–197.

An account of a September visit by the editor of the "*Leisure Hour.*" The Falls "grew on him," but he was disturbed by the crowds, the obtrusiveness of the guides, and other distractions.

1871
Marshall

MARSHALL, CHARLES. The Canadian Dominion. Lond.: Longmans Green. 1871. Pp. 85–92.

Niagara I. (Nation, Oct. 12, 1871. 13:238–239.) 1871

Niagara II. (Nation, Oct. 19, 1871. 13:254–255.)

A letter from Niagara, under date of September 28, deploring the abuse of the scenery and approving of " the most beautiful object in the world." The letter was evidently written by Henry James. It is reprinted in his " Portraits of Places."

The pure beauty of elegance and grace is the grand characteristic of the Fall. It is not in the least monstrous. It is supremely artistic — a harmony, a conception, a masterpiece; it beats Michael Angelo. One may seem at first to say the least, but the delicate observer will admit that one says the most, in saying that it is *pleasing*. There are, however, so many more things to say about it — its multitudinous features crowd so upon the vision as one looks — that it seems absurd for me to attempt to handle details. The main feature, perhaps, is the incomparable loveliness of the immense line of the river and its lateral abutments. It neither falters, nor breaks, nor stiffens, but maintains grandly from wing to wing its consummate curve. This noble line is worthily sustained by mighty pillars of alternate emerald and marble. The famous green loses nothing, as you may imagine, on a nearer view. A green more gorgeously cool and pure it is impossible to conceive. It is to the vulgar greens of earth what the blue of a summer sky is to our mundane azures, and is, in fact, as sacred, as remote, as impalpable as that. You can fancy it the parent-green, the head-spring of color to all the verdant water-caves and all the clear, sub-fluvial haunts and bowers of naiads and mermen in all the streams of the earth. The lower half of the watery wall is shrouded in the steam of the boiling gulf — a veil never rent nor lifted. At its core, this eternal cloud seems fixed and still with excess of motion — still and intensely white; but, as it rolls and climbs against its lucent cliff, it tosses little whiffs and fumes and pants of snowy smoke, which betray the furious tumult of its dazzling womb. In the middle of the curve, at the apex of the gulf, the converging walls are ground

1871 into finest powder, and hence arises a huge mist-column, and fills the upper air with its hovering drift. Its summit far overtops the crest of the cataract, and, as you look down along the rapids above, you see it hanging over the averted gulf like some far-flowing ensign of danger. Of these things some vulgar verbal hint may be attempted: but what words can render the rarest charm of all — the clear-cut brow of the Fall, the very act and figure of the leap, the rounded turn of the horizontal to the perpendicular? To call it simple seems a florid over-statement. Anything less combined and complicated never appealed to the admiration of men. It is carved clean as an emerald, as one must say and say again. It arrives, it pauses, it plunges: it comes and goes for ever: it melts and shifts and changes, all with the sound as of a thousand thunderbolts: and yet its pure outline never lapses by a bubble's value from its constant calm. It is as gentle as the pouring of wine from a flagon — of melody from the lip of a singer. From the little grove beside the American Fall you catch superbly — better than you are able to do at the Horse-shoe — the very profile of this full-flooded bend. If the line of beauty had vanished from the earth elsewhere, it would survive on this classic forehead. It is impossible to insist too strongly on the prodigious *elegance* of the great Fall, as seen from the Canada cliff. You fancy that the genius who contrived it was verily the prime author of the truth that order, measure, and symmetry are the conditions of perfect beauty. He applied his faith among the watching and listening forests, long before the Greeks proclaimed theirs in the shining masonry of the Acropolis. Rage, confusion, chaos, are grandly absent: dignity, grace, and leisure ride upon the crest: it flows without haste, without rest, with the measured majesty of a motion whose rhythm is attuned to eternity. Even the roll of the white batteries at the base seems fixed and poised and ordered, and in the vague middle zone of difference between falling flood and rising cloud you imagine a mystical meaning — the passage of body to soul, of matter to spirit, of human to divine.

Goat Island, of which every one has heard, is the great menagerie of lions, and the spot where your single stone — or, in plain prose, your half-dollar — kills most birds. This broad insular strip, which performs the excellent office of withholding the American shore from immediate contact with the Fall, has been allowed to remain a very proper piece of wildness, and here you may ramble, for the most part, in undiverted contemplation. The island is owned, I believe, by a family of co-heritors, who have the good taste to preserve it intact. More than once, however, as I have been told, they have been offered a large price for the privilege of building a hotel upon this sacred soil. They have been wise, but, after all, they are human, and the offer may be made once too often. Before this fatal day dawns, why shouldn't the State buy up the precious acres, as California has done the Yo-Semite? It is the opinion of a sentimental tourist that no price would be too great to pay. Otherwise, the only hope for their integrity is in the possibility of a shrewd prevision on the part of the gentlemen who know how to keep hotels that the music of the dinner-band would be injured by the roar of the cataract. You approach from Goat Island the left abutment of the Horseshoe. The little tower which, with the classic rainbow, figures in all "views" of the scene, is planted at a dozen feet from the shore, directly on the shoulder of the Fall. This little tower, I think, deserves a compliment. One might have said beforehand that it would never do, but, as it stands, it is incontestably picturesque. It serves as a unit of appreciation of the scale of things, and from its spray-blackened summit it admits you to an almost downward peep into the green gulf. More here, even, than on the Canada edge, you perceive how the great spectacle is wrought all in water. Its substantial floods take on at moments the likeness of walls and pillars and columns, and, to present any vivid picture of them, we are compelled to talk freely of emerald and crystal, of silver and marble. But really, all the simplicity of the Falls, and half their grandeur, reside in

1871

1871 the fact that they are built clean of fluid elements, and that no rocky staging or earthy commixture avail to complicate and vulgarize them. They are water piled on water, pinned on water, hinging and hanging on water, breaking, crashing, whitening in mutual masses of water. And yet for all this no solid was ever solid like that sculptured shoulder of the Horseshoe! From this little tower, or, better still, from various points further along the island-shore, it seems indeed a watery world. Before you stretches the huge expanse of the upper river, with its belittled cliffs, now mere black lines of forest, dull as with the sadness of gazing at eternal storm. Anything more horribly desolate than this boundless livid welter of the rapids it is impossible to conceive, and you very soon begin to pay it the tribute of your terror, in the impulse to people it with human forms. On this theme you can spin endless romances. Yes, they are alive, every fear-blanched billow and eddy of them — alive and frenzied with the sense of their doom. They see below them that nameless pause of the arrested current, and the high-tossed drift of sound and spray which rises up lamenting, like the ghosts of their murdered brothers. They shriek, they sob, they clasp their white hands and toss their long hair; they cling and clutch and wrestle, and, above all, they *bite*. Especially tragical is the air they have of being forced backward, with averted faces, to their fate. Every portion of the flood is like the grime stride of a giant, wading huge-kneed to his purpose, with the white teeth of a victim fastened in his neck. The outermost of three small islands, inter-connected by short bridges, at the extremity of this shore, places one in singularly intimate relation with this portentous flurry. To say that hereabouts the water leaps and plunges and rears and dives, that its uproar deadens the thunder, and its swiftness distances the lightning, is to say all that we can, and yet but a tithe of what we should. Nowhere surely in the wide world is water handled with such a masterly knowledge of effect.

The great spectacle may be called complete only when you 1871
have gone down the river some four miles, on the American side, to the so-called rapids of the Whirlpool. Here the unhappy stream tremendously renews its trouble. Two approaches have been contrived on the cliff — one to the rapids proper, the other, further below, to the scene of the sudden bend. The first consists of a little wooden cage, of the " elevator " pattern, which slides up and down a gigantic perpendicular shaft of horrible flimsiness. But a couple of the usual little brides, staggering beneath the weight of gorgeous cashmeres, entered the conveyance with their respective consorts at the same time with myself; and, as it thus carried Hymen and his fortunes, we survived the adventure. You obtain from below — that is, on the shore of the river — a specimen of as noble cliff-scenery as the continent can afford. The green embankment at the base of the sheer red wall is by itself a very fair mountain-slope; and from this starts erect, rugged and raw, a grandly spacious lateral section of mother earth. As it stands, Gustave Doré might have drawn it. He would have sketched with especial ardor certain parasitical shrubs and boskages — lone and dizzy witnesses of autumn; certain outward-peering wens and warts and other perpendicular excrescences of rock; and, above all, near the summit, the fantastic figures of sundry audacious minor cliffs, grafted upon the greater by a mere lateral attachment and based in the empty air, with great lone trees rooted on their verges, like the tower of the Palazzo Vecchio at Florence. The actual whirlpool is a third of a mile further down the river, and is best seen from the cliff above. Thus seen, it seems to me by all odds the finest of the secondary episodes of the Niagara drama, and one on which a scribbling tourist, ineffectively playing at showman, may be content to ring down his curtain. The channel at this point turns away to the right, at a clean right-angle, and the river, arriving from the rapids just above with stupendous velocity, meets the

1871 hollow elbow of the Canada shore. The movement with which it betrays its surprise and bewilderment — the sudden issueless maze of waters — is, I think, after the Horseshoe Fall, the superbest thing in its progress. It breaks into no small rage; the offending cliffs receive no drop of spray; for the flood moves in a body and wastes no vulgar side-spurts; but you see it shaken to its innermost bowels and panting hugely, as if smothered in its excessive volume. Pressed back upon its centre, the current creates a sort of pivot, from which it eddies, groping for exit in vast slow circles, barely outlined in foam. The Canada shore, shaggy and gaudy with late September foliage, closes about it like the rising shelves of an amphitheatre, and deepens by contrast the strong blue-green of the stream. This slow-revolving basin resembles nothing so much as some ancient palace-pavement, cracked and scratched by the butts of legionary spears and the gold stiffened hem of the garments of kings.

1872

1872 Dufferin

DUFFERIN, THE MARCHIONESS OF. My Canadian journal, 1872–78. Extracts from my letters home written while Lord Dufferin was governor-general. New York: 1891. Pp. 39–40; 450.

Give the author's impression of the Falls and a trip through the cave of the winds, and a paragraph dealing with Lord Dufferin's part in suggesting the Niagara Reservation scheme.

1873

1873 Medley

MEDLEY, JULIUS GEORGE. An autumn tour in the United States and Canada. Lond.: H. S. King. 1873. Pp. 86–88.

1874

1874 Whetham

WHETHAM, J. W. BODDAM. (Western wanderings; a record of travel in the evening land. Lond.: Bentley. 1874. Pp. 20–27.)

Guides and touts of all descriptions pressed their services upon us; urged us to take carriages, though the distance was only a few hundred yards, and generally proffered assistance, which, having no need of, we resolutely declined. Then, conscious of having

brought on ourselves the utter contempt of the crowd of would-be showmen, yet remaining firm in our determination not to be " done," we were all the more prepared to enjoy the magnificent spectacle awaiting us. 1874 Whetham

. . . . .

The stupendous grandeur of the scene that met my gaze far surpassed all I had imagined.

Niagara has been regarded with various feelings and from various mental points of view. Men of business have thought it has a good site for building; John Bull has pronounced it " a very nice waterfall, and a bigger stream than the Thames." Sentimental girls have gazed into its misty splendours with superstitious awe, and fancied they saw their fates there. The Yankee calls Niagara " *some*, in the way of water power." The Red Indian prays to it, " Oh, Father of mighty waters, grant a blessing on your child." But with whatever feeling the traveller from the East may view the Falls of Niagara, his eyes can have looked on no grander picture; and far as he may wander towards the setting sun, he cannot hope to see another so splendid.

All this time we have been looking at the Great Horse-shoe Fall, over which the enormous mass of water pours with tremendous force. Till it reaches half-way down, the water seems to hang like a green curtain as it rolls over the cliff; then, gradually breaking, the mighty mass spreads out in foam and falls into the gulf below. It is not its rapidity but its slowness which is so awe-inspiring:

Wie das Gestern,
Ohne Hast
Aber, ohne Rast.

But no words can describe the grandeur of such a scene.

. . . . .

We retraced our steps a short distance towards the American Fall, which is smaller than the Horse-shoe or Canadian Fall, but equally impressive.

1874 Whetham

. . . This Fall had a greater charm for me than the Horse-shoe Fall, perhaps because we were so much closer to it and were able to look straight down into its misty depths.

. . . . .

The minor drawbacks to visiting Niagara are the great number of tolls and the numerous touts. Regarding the former, if they would only charge so much on arrival, instead of giving you the trouble of putting your hand in your pocket every time you look at the Falls, it would be pleasanter; as for the latter, not one of them ought to be allowed near the place. If there is one thing more wanted than another, it is a pleasant drive or ride without a toll-gate at every mile, and this could be easily made along the shore of the Niagara river towards La Salle. The Goat Island toll is right enough, as keeping up the bridges and other expenses are incurred; but all other tolls are wrong, being wholly unnecessary.

. . . . .

We saw a great many beautiful birds, both in the surrounding woods and on the islands. There were two or three sorts of orioles, blue-birds, cardinal grosbeaks, and numbers of the American robins; birds as ubiquitous as our sparrows, and about the size of a large blackbird. Unfortunately, they are considered good eating, and therefore, as they are very tame, become an easy prey to every little wretch who carries a gun.

1875

1875 Morris

MORRIS, WILLIAM. Letters sent home. Out and home again by way of Canada and the United States; or, What a summer's trip told me of the people and the country of the great West. Lond.: F. Warne. N. Y.: Scribner, Welford and Armstrong. (1875.) Pp. 202–235.

It was very early in the morning when I left Toronto to cross Lake Ontario in one of the river steamers — a floating town. But the weather was beautiful, and the air most bracing. The distance across the lake is thirty miles, which brings us to the

The Falls in Winter with an Enormous "Cone" of Ice Formed in Front

mouth of the Niagara River, connecting Lake Ontario with Lake Erie. The river is by no means wide, and the country on either side is somewhat low and monotonous. Entering the river, we have Fort Massauga, a Canadian fortress, on the right, and Fort Niagara, an American fortress, directly opposite, on the left. Passing up the river, the banks on either side have more the appearance of a canal than of a river, being of a generally uniform slope. Six miles up the river we came to Lewiston, where we landed, and for the first time I here set foot on American soil. Having been discharged by the Custom House officer, who was stationed here to examine our baggage, we were taken by 'bus for about a mile to a railway station, and after another ride of about six miles along the top of the rocky and precipitous left side of the river, we arrived at the Falls railway station. The ride to this place was a most exciting one. In front there were the Falls, seen as yet only by the mind's eye, but we were making our way toward them through a rock-cut track, the sides of which sometimes seemed as though they would topple over and crush us, occasional breaks or opening in the rocks on the right affording glimpses of the river as it danced and ran madly on, and let in upon us, as with a great rush, the sound of troubled and rushing waters, and a half-suppressed "din," struggling as it were for mastery over the hissing of the engine and the rumbling of the carriages. . . . It would seem that the very pick of the touts and rascals of the world had assembled here. We could not move a yard without having some fellow at our heels descanting on the excellence and cheapness of the dinner he was at that very moment of time having placed on his table, and protesting by all that was good, that if we went further we should fare worse. Then the trinket sellers ran after us with their hands full of samples of the wares they had on offer inside their respective establishments, assuring us in the most earnest manner that we should never regret "walking in." As for the cab drivers, if they only worried their poor horses as they worried us, I can pity the poor horses from my heart. . . .

1875
Morris

1875 Morris

In due course, I was taking my first view of the Falls. We had passed by the ticket office, and had paid our toll; we had escaped from the importunities of bazaar keepers, and were out of sight of their wares; we had passed over bridges and between rocks and had lost ourselves amidst shrubs and flowering plants on Goat Island, and had surprised a party of Indian squaws arranging their bead trinkets for sale when the later hours of the day should bring the fashionable visitors to the place; when, as in an instant, I was standing on a projecting rock in the river's bank, from whence the full grandeur and majesty of the scene was brought within the range of vision. Overhead, the sky was without cloud or speck, and the sun shining most brilliantly. In front, there were the boiling seething waters, sending up clouds of spray, amongst which the sunbeams played and formed rainbows, arching each other. To the right of us there were the American Falls, and to the left of us the Horseshoe Falls. In the distance there was the suspension bridge crossing the river. In the back ground there were wooded heights, the foliage of the trees seeming to intensify the color of the water, as in one compact mass, many feet thick, and like a huge crystal, it hung over the precipice, the spray from the chasm below ascending as though it were incense playing its part in one grand and never ceasing act of worship, in which the utmost resources of nature had been gathered together to do honour and homage to the God of Nature.

1875 Offenbach

OFFENBACH, JACQUES. America and the Americans. Lond.: William Reeves. (1877. Pp. 74–75.)

After having looked a long time at the fall, I crossed the bridge and set foot on Canadian territory.

"You would like to see the Indians," they said.

I expected to find savages, but they showed me pedlars, men who produced *articles de Paris*. I was frightened at their ferocious attitude. I still recollect them. But were they really Indians? I rather doubt it.

Indians or not, they surrounded me, pertinaciously offering me bamboos, fans, cigar-cases, and fusee cases of doubtful taste. They recalled to my mind the Indians of the forest of Fontainebleau who sold penholders and paper knives. 1875 Offenbach

Nevertheless, I made a few purchases, but I verily believe I carried back to France some trifles which had been picked up at a Parisian bazaar which had been "selling off."

1878

MARSHALL, W. G. Through America; or, Nine months in the United States. Lond.: Sampson, Low, Marston, Searle, and Rivington. 1881. Pp. 71–84. 1878 Marshall

Excellent description of the view from the Clifton House and a full account of the abuses prevailing at Niagara. The account contains four photographic views.

1879

[Governor Robinson's message.] (Nation, Feb. 6, 1879. 28:101–102.) 1879 Robinson

A discussion of Governor Robinson's message proposing the reservation of Niagara Falls and giving arguments in favor of the plan.

NEW YORK STATE SURVEY. Special report on the preservation of the scenery of Niagara Falls, and fourth annual report on the triangulation of the state for the year 1879. James T. Gardner, Director. Albany: Charles Van Benthuysen and Sons. 1880. Pp. 1–42. 1879 New York State Survey

Special report of the Commissioners on the preservation of the scenery around the Falls; report of the director on the plan for a proposed State Reservation at Niagara; notes by Frederick Law Olmsted; Father Hennepin's description of Niagara; fac-simile of the first London edition; memorial to the governor of the State; extract from the message of Governor Robinson to the Legislature in 1879. The report is beautifully illustrated. Under the headings cited above it takes up a description of the beauties of Niagara, the description of the natural scenery, the arguments in favor of the proposed State Reservation, and suggestions as to limits of the territory to be set aside and the policy to be pursued in regard to the land set aside.

1880

1880 Berry

BERRY, C. B. The other side: how it struck us. Lond.: Griffith and Farran. 1880. Pp. 170–183.

The author found "two drawbacks to Niagara Falls — guides and gratuities." He describes the Maid of the Mist's trip through the whirlpool and his own crossing of the ice-bridge.

1880

The preservation of Niagara Falls. (Harp. w., May 15, 1880. 24:315.)

A digest of the State Survey Report of 1879. Discusses the disfigurement of the Falls and gives arguments for the preservation of the scenic effects.

1881

1881 Norman

[NORMAN, HENRY.] The preservation of Niagara. (Nation, Sept. 1, 1881. 33:170–171.)

A letter from Niagara Falls under date of August 22d, describing various abuses at the Falls, the destruction of the Falls as a summer resort, and appealing for the preservation of the Falls and their scenery and discussing the advantages of such a course.

1882

1882 Harrison

HARRISON, JONATHAN BAXTER. The condition of Niagara Falls, and the measures needed to preserve them. N. Y.: 1882.

Eight letters published in the *New York Evening Mail*, the *New York Tribune*, and the *Boston Daily Advertiser*, during the summer of 1882, and written in the interests of the propaganda for a State Reservation at Niagara.

1882 Hudson

HUDSON, T. S. A scamper through America, or, Fifteen thousand miles of ocean and continent in sixty days. Lond.: 1882. Pp. 230–237.

The author has the not unusual first impression that the Falls fall short of expectation, but later grows on one. He laments the prevalence of devices for extracting coin; he thinks it a pity that the two governments have not taken over the territory about the Falls.

1882 Lombardo

LOMBARDO, ALBERTO. Los Estados–Unidos. (Notas y Episodios de Viaje.) Mexico. 1884. Pp. 176–182.

The book contains a chapter on the Falls of Niagara. The author with a friend made the round of the various points of interest, Canadian and American, and was duly impressed with the scenic wonders of the place, and also plagued by vendors of curios.

[Preservation of Niagara Falls.] (Harp., Dec., 1882. 66:151–152.) 1882

An appeal for the preservation of the Falls by the reservation of a strip of land on both sides of the river.

SHARPE, WILLIAM. The international temple of Niagara. Reprinted from *Modern Thought*, Mar., 1882. Lond.: Modern Press. n. d. 1882 Sharpe

A glorification of Niagara as a natural temple and an appeal for its preservation.

1883

The destruction of Niagara. (Spec., June 30, 1883. 56:831–832.) 1883

A review of the American agitation concerning conditions at the Falls together with the history of the reservation movement. According to this author, " a common error is to suppose that the Falls themselves constitute the chief interest of Niagara." He goes on to say that " nothing could be more mistaken; the Falls are merely one of the constituent parts of the whole spectacle. The rapids, the islands, the cataract, the chasm below the cataract, the whirlpool rapids, the basin of the whirlpool — all these are included in the word ' Niagara.' "

LORNE, JOHN GEORGE EDWARD HENRY DOUGLAS SUTHERLAND CAMPBELL, *Marquis of*. Canadian pictures drawn with pen and pencil; with numerous illustrations from objects and photographs in the possession of and sketches by the Marquis of Lorne, Sydney Hall, etc., engraved by Edward Whymper. N. Y.: n. d. Pp. 66–69. 1883 Lorne

Shows desirability of making a park around the Falls; gives summer as the best season for seeing the scene. The article is illustrated by a view of the Falls from the American side.

LORNE, JOHN GEORGE EDWARD HENRY DOUGLAS SUTHERLAND CAMPBELL, *Marquis of*. The governor-general's reply to addresses from the royal academy and the Ontario society of artists, Toronto, June, 1883. (*In* Memories of Canada and Scotland: speeches and verses. Montreal: Dawson Brothers. 1884. Pp. 334–335.)

. . . There is only one other subject I would like to mention, though it has no direct connection with Art. But it is one mooted by Lord Dufferin, I think, in this very place, at all events in Toronto, some years ago. He asked me when I came not to

1883 Lorne

lose sight of it, but to push it upon all possible occasions. I allude to the formation of a national park at Niagara. I believe I am correct in saying that on the American side the suggestion originated with a mutual friend of Lord Dufferin's and mine, Mr. Bierstadt. . . .

1883 New York Legislature

NEW YORK (STATE) LEGISLATURE. An act to authorize the selection, location and appropriation of certain lands in the village of Niagara Falls for a state reservation and to preserve the scenery of the Falls of Niagara. (Laws of 1883, 106th sess., chap. 336, p. 603.)

Amended in Laws of 1884, 107th sess., chap. 109, p. 107.

1883

[Preservation of Niagara Falls.] (Critic, Feb. 17, 1883. 3:71–72.)

An editorial appeal for the preservation of the Falls and the passage of the reservation measure.

1883

A view of Niagara as it may be a few years hence. (Harp. w., Jan. 13, 1883. 27:32.)

Mills and factories in the gorge below and on the banks above.

1883–1885

1883–85 Welch

WELCH, THOMAS V. The state reservation at Niagara. Niagara Falls, N. Y.: 1885.

Speech of Hon. Thomas V. Welch of Niagara, in the Assembly of the State of New York, March 2, 1883, and his address before the joint committee of the Senate and Assembly, February 26, 1885. The first is in favor of the bill to authorize the selection and location of the reservation lands and the second in favor of the appropriation for payment of awards for the lands to be taken.

1884

1884 Griffin

GRIFFIN, *Sir* LEPEL HENRY. The great republic. Lond.: Chapman and Hall. 1884. Pp. 22–30.

The author evidently derived but little pleasure from his visit to the Falls for he rails against the disfigurement of the scenery by paper mills and other industries, is annoyed by the "all-pervading presence of brides," and oppressed by the Falls.

1884?

(The) State Reservation at Niagara Falls; testimony in appraisement proceedings. 2 vols. No. pub. n. d. 1884?

Spring and summer of 1884.

1885

MARSH, LUTHER R. Niagara's emancipation. Remarks of Mr. Luther R. Marsh, November 3, 1885, before the New York Historical Society, on reporting to it, as one of its committee, appointed to attend the opening ceremonies at the inauguration of the Niagara Reservation, July 15, 1883. New York: Martin B. Brown. 1885. 1885 Marsh

The address describes the opening ceremonies, the promoters of the reservation project and the emotions inspired by Niagara; and dwells upon the significance of the establishment of the reservation as the proclaiming of a new principle and a milestone in the progress of public sentiment to higher planes.

NEW YORK (STATE) LEGISLATURE. An act to provide for the maintenance and management of the state reservation at Niagara. (Laws of 1885, 108th sess., chap. 286, p. 490.) 1885 New York Legislature

NEW YORK (STATE) LEGISLATURE. An act to provide for the payment of the awards made for the lands selected and located by the commissioners of the state reservation at Niagara. (Laws of 1885, 108th sess., chap. 182, p. 337.)

Niagara Falls; quotation from the report of Luther R. Marsh on the reservation of Niagara Falls. (Mag. Am. hist., Dec., 1885. 14:610–611.) 1885

This report is an endorsement of the reservation act and its significance. "However considered, whether from a low plane or a high one, this act of consecration was judicious and wise."

NIAGARA FALLS ASSOCIATION. Report of the executive committee. Jan., 1885. Privately printed. 1885. 1885 Niagara Falls Association

(The) attempt to save Niagara. (Cent., Apr., 1885. 29 (new ser. 7):954–955.) 1885

A brief article calling attention to the recommendation of the Niagara Falls commissioners for the purchase of Niagara Falls lands by the state and the establishment of a state reservation as a means of preserving the scenery.

1885 Barker

BARKER, GEORGE. The redemption of Niagara.— Views near the cataract.— From photographs and sketches by George Barker, Niagara Falls. (Harp. w., July 18, 1885. 29:460–461, 466.)

Three large views: (1) The rapids above the Falls; (2) The Horseshoe Fall; (3) Whirlwind Bridge, at the Cave of the Winds. Page 466 contains a brief history of the establishment of the reservation.

1885 Carter

CARTER, JAMES C. Oration at the dedication of the state reservation at Niagara, July 15, 1885. (19th Ann. rep't of the com'rs of the state reserv. at Niagara. Albany: 1903. Pp. 263–277.)

The occasion upon which we are assembled has a peculiar interest which needs no aid from speech. A great commonwealth is here by her official representatives, with the Chief Magistrate at her head, to perform a solemnity; not, as sometimes, to dedicate a structure to some great purpose of public utility or charity — not to consecrate a monument to the virtue or valor of her sons — not to celebrate a great event in her annals; but to make a solemn public acknowledgment — to declare that the awful symbol of Infinite Power, in whose dread presence we stand — these visions of Infinite Beauty here unfolded to the eye, are not a property, but a shrine — a temple erected by the hand of the Almighty for all the children of men; that it cannot be desecrated without her permission, nor, therefore, without her crime; that she confesses the duty of guardianship imposed by her empire over the place; that she marks out the boundaries of the sanctuary, expels from the interior all ordinary human pursuits and claims, so that visitors and pilgrims from near or far may come hither, and be permitted to behold, to love, to worship, to adore.

It is now some two hundred years since the Falls of Niagara for the first time burst upon the gaze of civilized men. These were La Salle and his associates, then engaged in a bold exploration westward towards the Mississippi. One of the company, Father Hennepin, a Catholic priest, had journeyed from the Old World, and was familiar, at least by report and description, with the cataracts of Europe. In his account of his travels and discoveries he sought to convey an adequate idea of this great wonder; but

apparently felt, what all others since have felt, the utter insufficiency of language. He could but do little more than say, "The Universe does not afford its parallel!" But in the days of Father Hennepin the greater part of the earth was still a sealed book. Since that time every quarter of it has been explored. Rivers, mightier far than the Niagara, have been discovered. The Nile has been made to yield up his well-kept secret. The courses of the great rivers of Central Africa, interrupted by mighty cataracts, have been followed. Humboldts have penetrated the interior of the South American continent. The region of the Yosemite and the valley of the Yellowstone have been scrutinized by thousands of visitors. The world contains no undiscovered cataract; but the sentence of Father Hennepin, in describing Niagara, still remains true as when he uttered it, "The Universe does not afford its parallel!" 1885 Carter

The profound interest with which Niagara is beheld and remembered, and which gives it the first place among the great spectacles of nature, is due to a variety of elements, nowhere else to be found united. It is not owing chiefly to the sublimity of the scene, for the great mountain summits in many parts of the earth far surpass it in all the elements of the sublime. The loveliness of foliage and flower is displayed in more enchanting forms elsewhere in our own and in other lands. Finer examples of mere picturesque beauty in falls or rapids may be found amid the wonders of the Yosemite and Yellowstone valleys, and in other parts of the world.

Undoubtedly the master feature of the scene is the near exhibition of overwhelming power. Nowhere else among the works of nature is such an amount of physical energy concentrated within so narrow a compass. But the mere spectacle of power — power pitiless, remorseless, resistless, like that of the volcano, or the tornado — could never impart the pleasure, or create the exaltation which the visitor experiences here. Here the beholder, confounded and bewildered by the overwhelming sense of resistless power, has but to return for an instant and find recovery and

1885
Carter

relief in the spectacle of that same power, no longer let loose for destruction, like the wrath of the hurricane, but eternally flowing, restrained, obedient, beneficient, and arrayed in every robe of the beautiful. It is this combined appeal to every sense and every faculty, exalting the soul into a higher sphere of contemplation, which distinguishes this spot over all others.

There is in man a supernatural element, in virtue of which he aspires to lay hold of the Infinites by which he is surrounded. In all ages men have sought to find, or to create, the scenes or the objects which move it to activity. It was this spirit which consecrated the oracle at Delphi and the oaks of Dodona; reared the marvel of Eleusis, and hung in the heavens the dome of St. Peter. It is the highest, the profoundest, element of man's nature. Its possession is what most distinguishes him from other creatures, and what most distinguishes the best among his own ranks from their brethren. Surely, it must be allowed that everything which tends, on the one hand, to indulge this sentiment, or on the other to disparage or obstruct it, is matter of the deepest human concern.

It is a characteristic of this sentiment that it cannot endure a discord. The rapt soul, borne aloft in visions, cannot sustain its elevation in the presence of intrusions which recall it to earth; and so the visitor to this natural temple, like the worshipper in a great cathedral, cannot feel the best inspirations of the place, nor receive its high teachings, if disturbed or disconcerted by incongruous sights or sounds.

The peril thus suggested is one to which Niagara has long been exposed. The noble forest growths which once crowned these banks have in large measure disappeared. The tender draperies of foliage and flower which everywhere concealed the nakedness of the rocks, have, in many places been rudely stripped away. Unsightly structures, erected for what may be fitly called, in such surroundings, merely sordid purposes, everywhere meet the eye. And in addition, the ordinary accompaniments of places of public resort, the showmen, the venders of small wares, the guides

and other obtruders of petty and often needless services, with their small, but continual exactions, make up a sum of disturbing and irritating influences which tend to supplant with resentment and disgust, the high emotions which the scene would otherwise inspire. 1885 Carter

It was this degradation of the surroundings of Niagara which induced the effort of which we celebrate to-day the successful accomplishment. The residents of this neighborhood, justly proud of the possession of a great natural spectacle of sublimity and beauty which drew to them visitors from every part of the civilized world, the fond votaries of the scene, long accustomed to resort to it; and to study its features until they had

> "Got by heart
> Its eloquent of proportions"—

took alarm at the progress of the devastation. They knew, indeed, that the mighty floods from those inland seas could never be arrested, nor the thunders of the cataract silenced by human power:

> "Man marks the earth with ruin — his control
> Stops with the shore."

But they saw that the glorious framework of the divine picture was fragile as a web of gossamer, and that although the scene itself could never be destroyed, it might be disenchanted. They had learned also that much of the rare beauty of leaf, tree and flower, which seems to cling as if by some preference around the cataract, springs from conditions created by itself, and is, therefore, if I may borrow the fine language in which the thought has been expressed, "a part of its own majesty," and that to strip it of these glorious robes would be a dismemberment, leaving the great image a colossal deformity.

The circumstances which have thus tended to excite regret and even to arouse resentment in the hearts of the lovers of this great spectacle all over the world, could not, indeed, be imputed to the community which inhabited its neighborhood. They are such as

1885
Carter

necessarily arise in connection with every place of great public resort, where they are not checked and restrained by the presence of a general superintending authority, and probably exist here in a less degree than in many other places to which large numbers are attracted. We are, indeed, indebted to the kindly care of these residents, and especially to that of the family so long the proprietors of a most beautiful part of these banks, and whose name is not more closely associated with this place than with the patriotic annals of the nation, that so much of their native beauty remains untouched; and the promised restoration of the scene to its original grandeur is welcomed by none with greater delight than is felt by those whose lives have been passed in its great presence. This joyous festivity in which we are hospitably invited to share, is the demonstration of their high satisfaction with all the measures which have been taken to achieve so important a work.

To those who were thus led to consider in what way the further degradation of Niagara might be arrested, there was but one measure which seemed adequate. The real source of the evil was perceived to lie in the circumstance that the surroundings of the scene and its approaches had been suffered to become the subject of private ownership. Private proprietors, ordinarily at least, are not at liberty to devote their possessions, of whatever nature, to any other purposes than those of profitable use. The mistake was that the fair territory which lies along these banks should ever have been allowed to become private property. It was once the noble possession of the people of the State. Would that it had always so remained. The plain remedy was a resumption by the State of its former dominion and a movement was set on foot to bring about this result.

A suggestion tending in this direction was made in the summer of 1878 by the then Governor-General of Canada, Lord Dufferin, himself a well-known admirer of the great scenes of nature, to Governor Lucius Robinson, who made it the subject of a special communication to the Legislature of 1879, in which he

warmly recommended the concurrence of this State in the proposition of Lord Dufferin for the appointment of commissioners by the two governments respectively for the purposes of conference. Governor Robinson in his message expressed, in language worthy of his enlightened character, the real duty of governments whose territory embraces great natural spectacles. He said: "The civil jurisdiction over the Falls of Niagara, as well as the shores and waters of the Niagara river, is divided between this State and the Province of Ontario in Canada. But, in one sense, the sublime exhibition of natural power there witnessed is the property of the whole world. It is visited by tourists from all quarters of the globe, and it would seem to be incumbent upon both governments to protect such travelers from improper annoyance on either side." 1885 Carter

The recommendation of Governor Robinson was met by a joint resolution of both branches of the Legislature, directing the Commissioners of the State Survey to inquire and report what measures it might be expedient to make in order to carry out the purposes mentioned in the Governor's communication.

The movement thus initiated was reinforced by an appeal, in 1880, in the form of memorials, addressed respectively to Governor Alonzo B. Cornell and to the Governor-General of Canada by citizens of the United States and Canada, together with many others, residents of other lands. Among them are included the names most distinguished in the Church, in the State, in poetry, in letters, and in art. They bear the illustrious names of Carlyle, Emerson, Longfellow, Whittier, Holmes, Lowell and Ruskin. Rarely, indeed, has such a company of eminent men in different lands united in a common object.

The Commissioners of the State Survey discharged the duty devolved upon them by the joint resolution of the Legislature, by causing a careful examination to be made of the present condition of Niagara Falls and its surrounding scenery, and of the operation of the perils to which they were exposed. This examination was made by the accomplished director of the Commission, Mr.

1885
Carter

James T. Gardner, and Mr. Frederick Law Olmstead, whose ardent interest in the beauty of landscapes, natural as well as artificial, had long before inspired him with the deepest concern for the future of Niagara Falls.

The conclusions of the Commissioners, founded upon the examination thus made, were expressed in a report to the Legislature, drawn up in a manner altogether worthy of the subject and of themselves. They set forth in convincing terms the extent of the deterioration already reached, and the inevitable results of further neglect, and recommended the acquisition by the State of a limited area of land along the banks of the river, sufficient to enable the work of protection and restoration to be prosecuted with effect.

The Legislature, in 1883, passed an act adopting these recommendations, and providing a method for carrying them out. By this act a board of commissioners was constituted, to be appointed by the Governor, with authority to survey and lay out such parts of the land adjacent to the falls as it should, in their judgment, be expedient for the State to acquire, and to take the necessary judicial proceedings for ascertaining the value of the lands.

Of the character of the gentlemen appointed upon this commission I need not speak. They were selected by Governor Cleveland with wise discernment, and with reference only to their qualifications for a task so important. They at once proceeded with the discharge of their duties, and the entire work of selecting and surveying the lands and prosecuting the proceedings requisite to ascertain their value was accomplished so as to enable them to make their report early in the present year.

It was indeed necessary, in order to render these measures entirely effective, that an appropriation of public money should be made to pay the ascertained value of the lands and the attendant expenses. That crowning act was performed by the Legislature of 1885, and the present Governor of the State, who does us the honor of his presence to-day, is to be congratulated upon the opportunity which has fallen to him of closing, by his signa-

ture, the series of most honorable executive acts in this movement for the restoration of Niagara Falls. The transfer of title has now been completed, and we have been called to witness its public recognition. No longer is Niagara, at least upon this bank, the property of men. The formal title does, indeed, rest in that great corporation composed of the people of the State in their sovereign capacity; but they assert no ownership. They reverently acknowledge a trust. In the allotment among different races and nations of the majestic displays of natural beauty or power, this chief example has fallen under their dominion. But its great purpose and essential use are not thereby changed. It is theirs only to restore, protect and preserve — theirs only, in common with all lovers of the sublime and the beautiful, to revere and enjoy. 1885 Carter

The State of New York has done many memorable things which illumine her annals. She has erected great structures dedicated to charity. She has established a great system of universal education. She has raised and sent into the field vast armies to defend liberty and perpetuate the great nation of which she forms a part; but in no single act has she shown herself more worthy of her renown, or of the place she fills in the nation and in the world, than by avowing, as she does to-day, her intention to forever guard and secure this spot against all profanation, for the delight, the elevation and the improvement of mankind.

The effort has not passed into successful accomplishment wholly without a challenge. Minds accustomed to scrutinize narrowly the objects to which it is proposed to devote the public revenue have questioned whether our civil Constitution permitted such an expenditure for the mere purpose of indulging a sentiment. The question and its decisions are alike honorable. We cannot appropriate public moneys to anything but a public use. But public uses should certainly be deemed broad enough to embrace the gratification of the noblest aspirations of which human nature is capable. Pitiable, indeed, would be the spectacle of a people who had paralyzed themselves against the

1885
Carter

indulgence of a sentiment. It is in their sentiments that the life of a people is most truly manifested. Are we to teach at vast expense in our schools the methods and the order of nature, the ideals in poetry and art, and yet not cherish the majestic teacher that exalts all our ideals? It is our sectarian dissensions alone which prevent us from devoting any part of the public wealth to the highest of all public uses — religion; but in the worship inspired by this place we are all of one faith.

The sentiments of men are oftentimes more powerful than their interests even, and history furnishes some interesting proofs of the depth of the feelings, closely akin to those the triumph of which we celebrate to-day, which connect the sentiment of reverence in man with great natural objects. The superstition of early Greece asserted the existence at Delphi of a miraculous cleft in the earth, from which bursts forth a divine afflatus capable of inspiring the awful responses of Apollo; but this mere fable could scarcely have sufficed to render the spot the principal shrine of the favorite god. Situated in the most picturesque valley of Greece, at the foot of the lofty summit of Parnassus, it was the beauty and sublimity of the scene which enhanced the fame of the oracle. It was the surrounding scenery, exalting the imagination and kindling the religious emotions, which attracted the multitude of votaries and rendered the place the center of the Hellenic world. But the devout sentiments of the pilgrims were offended by the petty exactions of the neighboring seaport of Cirrha, and the fertile plain around the temple excited the cupidity of the neighboring husbandmen to make continual encroachments upon the sacred precincts of the god. The evil was endured for a time; but in the end Greece arose in resentment at the profanation, and in a devastating conflict of ten years, fitly styled the "Sacred War," destroyed the offending town and choked up its harbor; swept from the Circassian plain all evidences of human ownership, and thus vindicated the insulted majesty of the god, and asserted the right of worshippers from every land to approach the great oracle unmolested.

It was a characteristic trait of the poetic superstitution of Greece to personify the visible forms of nature in a spirit of peculiar sympathy and tenderness. Into what a sublime Pantheon would Greek imagination have converted a scene like Niagara! An abode for every divinity, with the Great Thunderer himself in the midst shaking "his ambrosial curls!" A more spiritual as well as philosophic faith has dispelled these fond illusions; but poetry is still left to sing her sweet lament over a disenchanted world. 1885 Carter

> "The intelligible forms of ancient poets,
> The fair humanities of old religion,
> The power, the beauty and the majesty
> That had their haunts in dale or piny mountain,
> Or forest by slow stream or pebbly spring,
> Or chasms and watery depths, all these have vanished,
> They live no longer in the faith of reason."

The modern world, with its restless industrial activities, may, perhaps, be less responsive to the inspirations of nature; but it is for the reason that the sensibilities are less awake, not that the voices are silenced. Nature addresses all ages in the same language, which the heart of man can understand without the aid of a mythology.

> "The word unto the prophet spoken
> Was writ on tables yet unbroken.
> The word by seers or seraphs told
> In groves of oak or fanes of gold,
> Still floats upon the morning wind,
> Still whispers to the willing mind."

Our work to-day is to restore a neglected oracle; to manifest our sense of the pre-eminent importance of this miracle of nature as a teacher — a source of every softening and elevating influence — to leave its own creative powers to reproduce its original majesty, and to throw wide open its beautiful gates, that all, of whatever race or clime, may enter in.

1885 Carter

But, though the immediate task of New York is accomplished, the whole work is not yet finished. The great and friendly nation which occupies the opposite bank holds in her hands a matchless part of the glories of Niagara. We are not to doubt that she is fully sensible of the duty which her dominion imposes, nor that that duty will be fully discharged. Our own endeavor had its origin, in part, in a suggestion proceeding from one of her distinguished chief magistrates. Our example cannot but stimulate her to decisive action. And what better pledge of everlasting amity could be given than a mutual and peaceful guardianship over these beautiful banks? The tumult of contending armies engaged in deadly strife was once drowned by the roar of the cataract. Does not that great voice forever say, " Peace, be still! " to the passions by which such strife is engendered?

" Oh! may the waves which madden in thy deep,
There spend their rage, nor climb the encircling steep,
And till the conflict of thy surges cease
The nations on thy banks repose in peace."

1885 Greene

GREENE, J. W. Free Niagara. Buffalo: Matthews, Northrup and Co. (1885.)

Conditions under private ownership compared with those after the " freeing " of Niagara, the story of " New York's imperial gift to mankind," by the editor of the *Buffalo Express.*

History of the reservation movement to date, arguments in favor of reservation, treasurer's report, text of law of 1883 authorizing selection of lands, address by association in favor of reservation, articles of association of the Niagara Falls Association, list of officers and members.

1885

The preservation of Niagara. (Nature, June 11, 1885. 32:131–132.)

A history of the movement for the preservation of the Falls quoted from *Science.*

1885

The preservation of Niagara. (Sci., May 15, 1885. 5:398–399.)

A history of the movement leading to legislation.

QUEEN VICTORIA NIAGARA FALLS PARK COMMISSIONERS. Annual reports, 1885 to date. 1885 Queen Victoria Park Commissioners

Much valuable material on the origin of the park, the policy and activities of the commissioners, the development of the state's property, the diversion controversy and the power situation, supplemented by contracts, legislative acts and special reports.

Saving Niagara. (Critic, Mar. 7, 1885. 3 (new ser.):109.) 1885

A brief history of the movement to save the Falls.

WELCH, THOMAS V. How Niagara was made free. The passage of the Niagara reservation act in 1885. (Pub. Buf. hist. soc. 5:325-329.) 1885 Welch

History of the movement for the reservation by one active in securing the measure, and who was afterwards superintendent of the reservation. The same article may be found in *Publication II of the Niagara Frontier Historical Society* reprinted from the Buffalo Historical Society.

1886

BIGOT, CHARLES. De Paris au Niagara; Journal de voyage d'une delegation. Paris: A. Dupret, Editeur. 1887. Pp. 140–156. 1886 Bigot

Notre visite a duré quatre longues heures qui ont passé aussi vite qu'une seule. Quand j'essaye de résumer l'impression de cette matinée, je ne trouve qu'un mot qui l'exprime bien: c'est le mot terreur. Le Niagara n'est pas seulement grand, imposant, magnifique: il est terrible, il est formidable, il est effroyable. Plus on visite, plus on s'arrête, plus on regarde, plus le sentiment de l'effroi va croissant. C'est une puissance de la nature déchâinée, auprès de laquelle l'homme n'est rien.

HARRISON, JONATHAN BAXTER. The movement for the redemption of Niagara. (New Princeton rev., Mar., 1886. 1:233–245.) 1886 Harrison

This article, as it were, supplements Mr. Robb's article. To quote: "The movement to save Niagara is of peculiar interest, because it was the first effort made in this country on so large a scale to use the machinery of government for an object of this kind, that is, for a purpose belonging so entirely to the realm of elevated sentiment and noble spiritual emotion."

1886 Lattimore

LATTIMORE, S. A. (A letter on the advantages of state ownership.) (Ann. rep'ts of the com'rs of the state reserv. at Niagara. Albany: 1886. 1:18–21.)

Senate document 35, February 17, 1885.

1886 New York Legislature

NEW YORK (STATE) LEGISLATURE. An act to incorporate the Niagara river hydraulic tunnel power and sewer company of Niagara Falls, New York. (Laws of 1886, 109th sess., chap. 83, p. 123.)

This grant for the construction of a tunnel or sewer was amended by the Laws of 1889, 110th sess., chap. 109, p. 112, so that water could be taken from the Niagara river for power purposes, and another amendment — Laws of 1891, 112th sess., chap. 235, p. 472,— dealing with the financial and business management of the corporation recognizes the Niagara Falls Power Company as successor of the Niagara River Hydraulic Tunnel and Sewer Company of Niagara Falls, New York.

NEW YORK (STATE) LEGISLATURE. An act to incorporate the Lockport water supply company. (Laws of 1886, 109th sess., chap. 106, p. 187.)

This grant to take water from the Niagara river was repealed in the Laws of 1906, 129th sess., chap. 269, p. 570.

1886

[Original resolution describing the proposed limits of the Niagara reservation.] (Ann. rep'ts of the com'rs of the state reserv. at Niagara. Albany: 1886. 1:11–15.)

Senate document 35, February 17, 1885.

1886 Robb

ROBB, J. HAMPDEN. Buying Niagara. (Cent., Dec., 1886. 20: 815–823.)

A story of the movement to preserve Niagara, its significance, and the difficulties overcome. According to Mr. Robb, the buying of Niagara was "another instance of the power of mere *sentiment* among men."

1887

1887 New York State Reservation

NEW YORK STATE RESERVATION AT NIAGARA. By-laws of the commissioners, together with the ordinances, rules and regulations for the government of the reservation. (Ann. rep'ts of the com'rs of the state reserv. at Niagara. Albany: 1887. 2:25–28.)

OLMSTEAD, FREDERICK LAW, *and* VAUX, CALVERT. General plan for the improvement of the Niagara reservation. Niagara Falls, N. Y.: 1887. 1887 Olmstead & Vaux

The keynote of the plan is . . . "to restore and conserve the natural surroundings of the Falls of Niagara, rather than attempt to add anything thereto, is the true policy for the State to pursue. Not park, nor pleasure ground, but "Reservation" is the name affixed by the Legislature to the property now happily recovered to the people. It is a spot *reserved*, and sacred to what divine power has already placed there, rather than a proper field for the display of human ingenuity or art."

This plan may also be found in the *Supplemental Report of the Commissioners of the State Reservation at Niagara*. Albany. 1887, pp. 9–50.

STRATHESK, JOHN, *pseud.* Bits about America. Edinb.: Oliphant, Anderson and Ferrier. 1887. Pp. 116–129. 1887 Strathesk

An account of a winter visit early in 1887. The author was offended by the utilitarian public works around the Falls.

1888

NEW YORK (STATE) LEGISLATURE. An act to incorporate the Lewiston water supply company in Niagara county, New York. (Laws of 1888, 111th sess., chap. 561, p. 918.) 1888 New York Legislature

This grant, which permits water to be taken from the Niagara river, was repealed by the Laws of 1906, 129th sess., chap. 267, p. 569.

1889

NEW YORK (STATE) LEGISLATURE. An act to incorporate the Buffalo and Niagara power and drainage company. (Laws of 1889, 112th sess., chap. 366, p. 484.) 1889 New York Legislature

This act is repealed in the Laws of 1906, 129th sess., chap. 268, p. 570.

NEW YORK STATE RESERVATION AT NIAGARA. Resolutions and correspondence relating to a roadway from the state reservation at Niagara to Lake Ontario. (Ann. rep'ts of the com'rs. Albany: 1889. 5:51–55.) 1889 New York State Reservation

1889 New York State Reservation

The correspondents are Andrew H. Green, president of the commissioners, John Bogart, State Engineer and Surveyor, and C. S. Gzouski, chairman of commissioners, Q. V. N. F. Park.

The papers may be found in Assembly document 22, February 6, 1889.

1890

1890 Green

GREEN, ANDREW H. Letters concerning the diversion of waters from Niagara Falls. (Ann. rep'ts of the com'rs of the state reserv. at Niagara. Albany: 1890. 6:57–60.)

Assembly document 23, January 22, 1890.

The Hon. Andrew H. Green, who was president of the Board of Commissioners from 1888 to 1903, was particularly active in opposition to diversion schemes. It was he who first suggested international action.

Letters addressed to the Legislature; to Hon. Samuel Frederick Nixon, chairman of the Assembly committee on internal affairs; Hon. George B. Sloan, Senate. These letters voiced the opposition of the Commission to the bill entitled "An act to authorize the Niagara Hydraulic Electric Company to erect machinery under the Falls. . . ."

1890 Kroupa

KROUPA, B. An artist's tour; gleanings and impressions in North and Central America and the Sandwich Islands. Lond.: Ward and Downey. 1890. Pp. 327–330.

I had seen the Falls several times during my previous stay in Canada. They are no doubt sublime, and the scenery around is wild and grand, but the land in the vicinity of and including the Falls, was then private property, and thrown open to the public at such ridiculously high charges that the cost of seeing all around and below the Falls was very expensive. I could hardly divest my mind of the idea that I was not " doing " Niagara, but that Niagara was " doing " me. The latter conjecture was ever present in my thoughts, for after I had been there for a few minutes during my first visit, I began to lose money, and after a couple of days I was almost beggared in trying to get near the cataract. There were so many fees and gratuities to be paid at the various " entrances " to the Falls, under the Falls, to the caves, and over the bridges, that after all the worry and expense one could have readily sympathized with the man who,

on being politely requested by his cicerone to come again at some future time, asked to be thrown in rather than return to see them. One gets accustomed, however, to everything. I walked and paid almost mechanically until I went about with my pockets inside out. Although I refused the aid of several guides who followed at my heels, as is the custom of that fraternity, I paid in less than two days more than eight dollars in admission fees, including those at every bridge. 1890 Kroupa

Let us imagine a *pater-familias* going to see the Falls accompanied by his better half, and say half a dozen of children. Arrived there, he would read: Entrance to the Falls, twenty-five cents each person; further on: Entrance to the Cave of the Winds, fifty cents, etc., etc. Seeing that he would have to pay such a heavy ransom, he would most naturally explain to his wife and offspring how much grander the Falls look when seen from a distance. All this, however, is changed now, as all the land adjoining the Falls on the American side has been bought by the State in which they are situated.

After this comparison of the unpleasant conditions at the Falls on his earlier visit with the improved conditions at the present time the author goes on to give the impression of active and irresistible power conveyed by the Falls at all times, and to give a slight sketch of their beauty in winter.

1891

GREEN, ANDREW H.; BOGART, JOHN; KIBBE, AUGUST S. Letters concerning surveys and appropriations. (Ann. rep'ts of the com'rs of the state reserv. at Niagara. Albany: 1891. 7:81–88.) 1891 Green

Assembly document 45, January 29, 1891.

NEW YORK (STATE) LEGISLATURE. An act to incorporate the Niagara county irrigation and water supply company. (Laws of 1891, 114th sess., chap. 259, p. 483.) 1891 New York Legislature

Grants the corporation the right to take water from the Niagara river to supply the towns of Niagara, Lewiston, or Porter in the county of Niagara.

1891 The utilization of Niagara. VII. (Eng. (Lond.), Jan. 2, 1891. 51:14, 18, 19–21.)

Discusses the recession of Niagara and gives a quotation from Dickens's description of the Falls.

The utilization of Niagara. VIII. (Eng. (Lond.), Feb. 27, 1891. 51:235–236.)

An account of the investigations of Mr. John Bryant as to low water at Niagara Falls and the effects of diversion. The awards of the International Niagara Commission are also given.

1892

1892 New York Legislature NEW YORK (STATE) LEGISLATURE. An act relating to the Niagara Falls power company. (Laws of 1892, 115th sess., chap. 513, p. 1041.)

Section 2 grants the right to the corporation to take and use water of the Niagara river upon condition of furnishing free light, power and water to the Niagara reservation. This condition was the subject of controversy between the Commissioners of the State Reservation and the company for many years, the Commissioners refusing to accept this free light, heat and power for fear of involving the state of New York in a contractual obligation with the power company.

Under this grant the company is not permitted to obstruct the navigation of the Niagara river, nor "to take therefrom more water than shall be sufficient to produce two hundred thousand effective horse-power."

1893

1893 New York Legislature NEW YORK (STATE) LEGISLATURE. An act concerning the Niagara Falls power company. (Laws of 1893, 116th sess., chap. 477, p. 973.)

Grants the corporation the right to furnish power, heat or light to any person or body, and to obtain rights from individuals, corporations or bodies to cross any lands, public or private, for the purpose of furnishing such power.

1893 NEW YORK (STATE) LEGISLATURE. An act to incorporate the Model town company, to define its rights, powers and privileges and for other purposes. (Laws of 1893, 116th sess., chap. 707, p. 1753.)

Section 14 grants the right to "take water from Lake Erie, and except for motive power for factories from Niagara river and by separate systems of pipes, ditches, canals, aqueducts or syphons, may carry said water to and into any town site it may require in Niagara county."

1894

GREEN, ANDREW H. Letter to Walter Q. Gresham, secretary of state, Washington, concerning the diversion of water at Niagara Falls, under date of October 17, 1894. (Ann. rep'ts of the com'rs of the state reserv. at Niagara, 12:49–50.) 1894 Green

An appeal for international action.

GREEN, ANDREW H. Letter to J. W. Langmuir, chairman of the commissioners of Queen Victoria Niagara Falls Park, under date of October 19, 1894, concerning the diversion of water at Niagara Falls. (Ann. rep'ts of the com'rs of the state reserv. at Niagara. 12:51.)

An appeal for cooperation to secure international action for the protection of the Falls.

GREEN, ANDREW H. Letter to Theodore E. Hancock, attorney general of the state of New York, under date of July 17 and 18, 1894, concerning the diversion of water at Niagara Falls. (Ann. rep'ts of the com'rs of the state reserv. at Niagara. 12:52–53.)

Request for an opinion on the right of the Niagara Falls Hydraulic Power and Manufacturing Company to enlarge its canal.

NEW YORK (STATE) CONSTITUTIONAL CONVENTION, 1894. Revised record of the constitutional convention of . . . New York, May 8, 1894, to September 29, 1894. Rev. by W. H. Steele. Albany, N. Y.: The Argus Printing Co. 1890. 1894 New York Constitutional Convention

For the debates on the constitutional provision to limit the diversion of water from the Niagara river, see especially vol. 3, pp. 808–873; vol. 4, pp. 164–173, 612–615, 627–641, and vol. 5, pp. 727–728.

NEW YORK (STATE) LEGISLATURE. An act to amend chapter 707 of the laws of 1893 entitled "An act to incorporate the Model town company, to define its rights, powers and privileges and for other purposes." (Laws of 1894, 117th sess., chap. 605, p. 1370.) 1894 New York Legislature

This amendment changes the Model Town Company to the Niagara Power and Development Company and grants power to " purchase or lease the franchise, improvements and all rights of the Niagara County Irrigation and Water Supply Company " which was incorporated in the laws of 1891, 114th sess., chap. 259, p. 483.

1894 New York Legislature

NEW YORK (STATE) LEGISLATURE. An act to incorporate the Niagara, Lockport and Ontario power company. (Laws of 1894, 117th sess., chap. 722, p. 1806.

Section 10 gives the conditions under which water may be taken from the Niagara river and distributed for water supply or power purposes.

1894 Queen Victoria Park

QUEEN VICTORIA NIAGARA FALLS PARK. Official documents 1894.

Legislative acts and papers relating to the park together with the first annual reports of the commissioners of the park.

1894 Schenk

SCHENK, M. Report on roadway from the reservation to Lake Ontario. (Ann. rep'ts of the com'rs of the state reserv. at Niagara. Albany: 1894. 10:55–56.)

Recommends steps looking toward preliminary legislation.

1895

1895 Barhite

BARHITE, JOHN A. Report to the constitutional convention of the subcommittee of the committee on legislative powers relative to the diversion of the waters of Niagara. (Ann. rep'ts of the com'rs of the state reserv. at Niagara. Albany: 1895. 11:61–73.)

Document No. 60. An examination of existing water rights and privileges at Niagara, with respect to fact and law. Grants already made are reviewed, dangers to the Falls pointed out, the legal right of the state in the river discussed, and a constitutional amendment recommended which provided for the restriction of grants to certain specified purposes and proposed to put companies already organized under the direction and control of the Commissioners of the State Reservation at Niagara.

1895 Hancock

HANCOCK, THEODORE E. Opinion concerning the diversion of water at Niagara Falls, under date of November 16, 1895. (Ann. rep'ts of the com'rs of the state reserv. at Niagara. 12:53–61.)

1896

1896 Dunlap

DUNLAP, ORRIN E. Water supply of Niagara. (W. elec., Feb. 8, 1896. 18:63.)

A discussion of the danger of drawing off so much water for power purposes as to ruin the beauty of the Falls.

1896 New York Legislature

NEW YORK (STATE) LEGISLATURE. An act confirming and defining certain riparian rights of the Niagara Falls hydraulic power and manufacturing company. (Laws of 1896, 119th sess., chap. 967, p. 1393.)

The Niagara reservation. (Critic, Mar. 21, 1896. 28:203.) 1896

A protest against the proposal to abolish the Reservation Commission and transfer its functions to the Fisheries, Game and Forest Commission.

UNITED STATES CONGRESS. Report of the deep waterways commission prepared at Detroit, Michigan, December 18–22, 1896, by the commissioners, James B. Angell, John E. Russell, Lyman E. Cooley, accompanied by a report on technical work and several topical reports and drawings pertaining thereto. Washington: 1897. H. R. doc. 92. 54th Cong., 2d sess. 1896 United State Congress

1897

D. W. The glory of Niagara. (Life & health (N. Y.), Aug. 1897. Pp. 264–266.) 1897 D. W.

Need of time for due comprehension of the wonders and appreciation of the beauties of Niagara: improvements at hotels and elsewhere since pre-reservation days.

DAVIS, REBECCA HARDING. The passing of Niagara. Indep., Nov. 25, 1897. 49:1527–1528.) 1897 Davis

A fanciful imagination of the danger to be faced of Niagara being sacrificed to the dollar.

[Electrical review.] Editorial comment on the "alleged destruction" of the Falls. (Nov. 3, 1897. 31:216.) 1897

MEREDITH, E. A. The Queen Victoria Niagara Falls Park. (Can. mag., July 1897. 9:228–239.) 1897 Meredith

A review of the report of the Canadian commissioners for 1895, dealing with the origin of the park, its area, the improvements which had been made, the finances, and the scenery.

1900

The discharge of the Niagara river. (Eng. mag., April, 1900. 19:129–130.) 1900

A condensation of an elaborate account of recent measurements of flow in the Niagara under the U. S. Board of Engineers on Deep Waterways, as given by Mr. Clinton W. Stewart in a paper before the Western Society of Engineers.

1901

1901 Hartt

HARTT, MARY B. The passing of Niagara. (Outl., May 4, 1901. 68:21–28.)

An account of the desecration of the scenery at the Falls, the practical considerations involved, the effect of diversion, the struggle for preservation, and the dangers from natural causes. Says the author: "Niagara together with scores of other beautiful and picturesque things in this prosaic world of ours, is passing. Saved from the hands of the catch-penny sharper, it has fallen into the hands of the catch-million capitalist. Rescued from the toils of a commercial conspiracy, it will but vanish under the pitiless processes of Nature."

1902

1902

The creation and development of the state reservation at Niagara. (Ann. rep'ts of the com'rs of the state reserv. at Niagara. 1902. 19:14–84.)

A history of the reservation movement, the establishment of the reservation, the restoration and preservation of the scenery, the cost of the reservation, the problems presented, and the policy of the commissioners.

1902 International Waterways Commission

INTERNATIONAL WATERWAYS COMMISSION. Documents relating to. (Ann. rep'ts of the com'rs of the state reserv. at Niagara. 19: app. 255–261.)

Resolution for the appointment of a commission, report of the Committee of Commerce thereon, and the opinion of the War Department, amended act.

1902 New York Legislature

NEW YORK (STATE) LEGISLATURE. An act to incorporate the lower Niagara river power and water supply company. (Laws of 1902, 125th sess., chap. 539, p. 1288.)

1903

1903 Green

GREEN, ANDREW H. Last public address of the late Hon. Andrew H. Green, concerning the state reservation at Niagara. (Ann. rep'ts of the com'rs of the state reserv. at Niagara. 20:91–104.)

A history of the establishment of the reservation and some reasons justifying the setting aside of the Falls property as a public park. Read before the convention of the American Park and Outdoor Art Association of Niagara Falls, July 7, 1903.

GREEN, ANDREW H. Saving Niagara. (In American park and outdoor art association. General addresses of the 7th annual meeting. Buffalo, July, 1903. 7: pt. 4, 12–18.) 1903 Green

Mr. Green's address deals with the lesson of Niagara and its significance, gives the history of the reservation and an account of its administration at the time the address was made.

[Preservation of Niagara Falls.] (Eng. news, Apr. 16, 1903. 49:347.) 1903

An editorial suggested by the *New York Tribune*'s agitation.

1904

BURNE-JONES, PHILIP. Dollars and democracy. With numerous illustrations from original drawings by the author. N. Y.: 1904. Pp. 234–238. 1904 Burne-Jones

The author saw the Falls in spring between seasons. He apparently appreciated the Falls, but was so indignant over the desecration of the scenery and the commercialization of the cataract that he says almost nothing about them.

CONSTITUTIONAL CONVENTION. Report of the subcommittee on proposed constitutional amendment. (Ann. rep'ts of the com'rs of the state reserv. at Niagara. 1904. 21:149–167.) 1904 Constitutional Convention

A history of privileges already granted and the rights of the state in the premises, together with a proposed amendment restricting the granting of water rights and controlling diversion under existing franchises.

DALE, STEPHEN M. Seeing Niagara Falls for the first time. Ladies home jour., June, 1904. 21:9–10.) 1904 Dale

The author tells us where Niagara is and how it came to be, gives some of the amusing comments heard there, and the number of annual visitors, describes the "chaining" of Niagara, the gorge ride and the moonlight view of the Falls, with some tales of the troublesome cabmen.

DOW, CHARLES M. Letter to Governor Odell, requesting him to veto the Niagara, Lockport and Ontario power company bill. (Ann. rep'ts of the com'rs of the state reserv. at Niagara. 21:215–229.) 1904 Dow

The letter cites the dangers threatening the Falls, the arguments economic, esthetic and legal, against the bill in question and the arguments for the preservation of the Falls.

Memorandum concerning the jurisdiction, powers and proceedings of the commissioners of the state reservation at Niagara with respect to the 1904

1904 preservation of the Falls and scenery of Niagara. (Ann. rep'ts of the com'rs of the state reserv. at Niagara. 21:59–80.)

The following memorandum has been prepared with a view to collating facts concerning:

First. The jurisdiction and powers of the Commissioners of the State Reservation at Niagara with respect to the preservation of the Falls and scenery of Niagara;

Second. What the commission has done to prevent the impairment of the beauty of the Falls and the environment; and

Third. The course of legislation with respect to charters to private corporations affecting directly or indirectly the Falls and their environment.

1904 New York State Reservation

NEW YORK STATE RESERVATION AT NIAGARA. Official correspondence and opinions. (Ann. rep'ts of the com'rs of the state reserv. at Niagara. 21:117–148.)

Concerning the diversion of water at Niagara Falls, and the efforts of the commissioners of the State Reservation to prevent it.

NEW YORK STATE RESERVATION AT NIAGARA. Extracts from annual reports. (Ann. rep'ts of the com'rs of the state reserv. at Niagara. 21:81–116.)

Concerning the diversion of the waters of the Niagara river at the Falls and the efforts of the commissioners of the State Reservation to preserve the integrity of the Falls.

1904 Resumé of legislation concerning Niagara power corporations. (Ann. rep'ts of the com'rs of the state reserv. at Niagara. 21:185–213.)

Stages of legislation and votes on charter of Niagara power corporations.

1905

1905 Adams ADAMS, ALTON D. The destruction of Niagara Falls. (Cass, Mar., 1905. 27:413–417.)

According to Mr. Adams, "Niagara Falls are doomed. Children already born may yet walk dry-shod from the mainland of the New York State Reservation to Goat Island, across the present bed of the Niagara River. Certain economic, industrial, and political forces are working strongly toward this result, and their course can be staid only by the strong hand of the government."

THE FALLS IN WINTER

Taken just below Prospect Point which may be seen in the distance with many people assembled

ADAMS, ALTON D. How to save Niagara Falls. (Tech. wld., Oct., 1905. 4:161–167.) **1905** Adams

The possibility of enormous water power development without affecting the Falls by damming the river below.

CLARKE, JOHN M. The menace to Niagara. (Pop. sci. mo., Apr., 1905. 66:489–504.) **1905** Clarke

An article by the New York State Geologist on the impending destruction of the Falls and the remedy. According to Dr. Clarke, the American fall is in danger of becoming " as dry as bone." He thinks it is too late to find out how much may be safely withdrawn. " In taxation of the power product, not necessarily for revenue but for protection," seems to Dr. Clarke, " to lie the sole means of control of the problem, the only way of saving our national pride before the bar of the world."

The destruction of Niagara Falls. (R. of R., Apr., 1905. 31:490.) **1905**

A review of an article by Alton D. Adams in the March number of Cassier's Magazine.

DOW, CHARLES M. Address to the international commissioners appointed to investigate concerning the conditions and uses of the waters adjacent to the boundary lines between Canada and the United States, at Niagara Falls, New York, September 14, 1905. (Ann. rep'ts of the com'rs of the state reserv. at Niagara, 22:67–75.) **1905** Dow

Deals with the economic and esthetic considerations for the preservation of the Falls and the effects of further diversion, together with a plea for international protection.

DUNLAP, ORRIN E. Is Niagara doomed? (Tech. wld., July, 1905. 3:557–568.) **1905** Dunlap

This article deals with the wonderful power developments which are transforming the environs of the cataract.

International waterways commission organized. (Ann. rep'ts of the com'rs of the state reserv. at Niagara. 22:16–30.) **1905**

A history of the movement for an international waterways commission to consider the question of diversion of Niagara waters, the establishment of the commission, the enlargement of its powers, the protection of Niagara by legislation and constitutional amendment, and discussion of the question as to where the power of protection lies.

1905 McFarland

McFarland, J. Horace. Shall we make a coal pile of Niagara? (Ladies' home jour., Sept., 1905. 22:19.)

1905 New York Legislature

New York (State) Legislature. An act to amend the public lands law, by including certain lands of the state as a part of the state reservation at Niagara. (Laws of 1905, 128th sess., chap. 508, p. 1166.)

This act added to the State Reservation at Niagara certain lands deeded to the state by the Niagara Falls Hydraulic Power and Manufacturing Company.

1905 Potter

Potter, Alvah K. Address to the international commissioners appointed to investigate concerning the conditions and uses of the waters adjacent to the boundary lines between Canada and the United States, at Niagara Falls, New York, September 14, 1905. (Ann. rep'ts of the com'rs of the state reserv. at Niagara. 22:77–81.)

A brief address devoted to the legal and practical aspects of the question in its national and international relation.

1905

Preserve Niagara. (Outl., Oct. 14, 1905. 81:348.)

An editorial on the resolution of the American Civic Association based on the provision of the ordinance of 1787 which made "carrying places" between the Mississippi and St. Lawrence common highways.

1905

Save Niagara Falls. (Outl., Nov. 25, 1905. 81:696.)

A brief appeal to the public.

1905 Thunstrom

Thunstrom, Louis L. How to save Niagara. (Sci. Am., July 8, 1905. 93:27.)

A letter proposing a dam above the Falls to regulate the flow.

1905

Vandalism at Niagara Falls. (Sci. Am., Apr. 15, 1905. 92:298.)

Editorial protest against the sacrifice of Niagara Falls to a few.

1906

1906 Adams

Adams, Alton D. Diversion of water from Niagara. (Elec. wld. & eng., Apr. 28, 1906. 47:875–876.)

An effort to show that only a small part of the water diverted by power plants in Queen Victoria Niagara Falls Park could have found its way to the American Falls.

ADAMS, ALTON D. Niagara Falls already ruined. (Tech. wld., Apr., 1906. 5:115–124.) 1906 Adams

The author points out that the concessions already granted are sufficient to use all the water.

AMERICAN CIVIC ASSOCIATION. Preservation of Niagara Falls: memorandum submitted on behalf of the people of the United States, at the hearing held Nov. 26, 1906, before the Hon. W. H. Taft, secretary of war, in the matter of the admission of electric power generated in Canada from the water of the Niagara river. (1906). 1906 American Civic Association

Opposition to admission on the ground that it would endanger the Falls by encouraging diversion on the Canadian side.

[The bill for the preservation of Niagara Falls.] (Eng. news, June 7, 1906. 55:642.) 1906

The Burton bill and its provisions.

The desecration of Niagara. (Ladies' home jour., June, 1906. 23–27.) 1906

Urges the writing of letters to Representatives and Senators in Congress.

Diversion of Niagara river. (Sci. Am., Mar. 17, 1906. 94:226.) 1906

An editorial on the prospect of international control and the ethics of the preservation question.

DOW, CHARLES M. How to protect Niagara Falls. (Outl., Jan. 27, 1906. 82:179–189.) 1906 Dow

"We commend this article, which reviews in order the encroachment upon Niagara Falls, and also the work which has been steadily carried forward for a score of years to check these encroachments. The conclusions which Mr. Dow arrives at are clear and specific. The most important of these conclusions is the necessity for 'joint action of the government of the United States and the proper British authorities.'" *Outl. 82:150.*

The situation, then, as it appears to the writer, may be recapitulated as follows:

1. The authorized diversion of the waters of the Niagara River, when exercised to its full extent, will seriously but not wholly impair the Falls.

2. That further suggested diversion should be prevented, if possible.

1906 Dow

3. That the transfer of the State Reservation at Niagara Falls from the State of New York to the Federal Government would be valueless as a remedy against the proposed evil.

4. That this diversion can be absolutely prevented by the joint action of the Government of the United States and the proper British authorities.

5. That it is desirable that the Legislature of the State of New York should revoke all charters for the diversion of water under which operations have not been commenced in good faith.

6. That an amendment to the Constitution of the State should be adopted providing for the perpetual protection of the waters of Niagara River.

7. That the Congress of the United States should exercise at once all the powers it may possess to prevent such diversion.

1906

Dry as Niagara. (Outl., Nov. 24, 1906. 84:690–691.)

An editorial urging pressure on the secretary of war to prohibit all encroachment upon the Falls.

1906 Dunlap

DUNLAP, ORRIN E. The crime against Niagara. (Harp. w., Apr. 7, 1906. 50:474–476.)

1906 Gregory

GREGORY, HENRY ELLSWORTH. Legal status of the Niagara river. N. Y.: 1906.

A brief on international law governing the Niagara river furnished the American Scenic and Historic Preservation Society and transmitted to Hon. T. E. Burton, chairman of committee on rivers and harbors, by Edward Hagaman Hall, secretary of the American Scenic and Historic Preservation Society.

1906

The Hearing at Niagara Falls. (Outl., July 21, 1906. 83:632–633.)

Help to save Niagara Falls. (Outl., Apr. 21, 1906. 82:865–866.)

1906

How the power companies beautify Niagara. (Ladies' home jour., Oct., 1906. 23:39.)

Urging letters to Secretary of War Taft and to Sir Wilfrid Laurier, Prime Minister of Canada.

Industrie (L') Americaine fera-t-elle-disparatrie les chutes du Niagara. (Le tour du monde-a travers le monde. n. s. annee 12 [1906] Paris: 1906. Pp. 289–292.) **1906**

An article on the spoliation of Niagara by the overdevelopment of its power facilities. The article contains three illustrations showing some of the most disfiguring effects of the power installations. The art of preserving and increasing natural beauty is so well understood in France, that this article is interesting as giving us the French point of view.

International protection of Niagara Falls. (Sci. Am., Apr. 21, 1906. 94:322.) **1906**

Editorial comment on Senator Burton's suggestions.

KUTZ, *Capt.* CHARLES W. Reports upon the existing water power situation at Niagara Falls, so far as concerns the diversion of water on the American side; by the American members of the International Waterways Commission and Captain Charles W. Kutz, Corps of Engineers, U. S. A. Wash.: Gov't. print. off. 1906. **1906** Kutz

LANIER, ROBERT S. International aid for Niagara. (R. of R., Apr., 1906. 33:432–439.) **1906** Lanier

An appeal for the preservation of the Falls and a review of the efforts to save them. To quote: " The public feeling behind these movements is not necessarily insensible to the glory of having at Niagara ' the power center of the world,' or blind to the fascination of unique hydraulic problems magnificently executed. But it finds a glory and magnificence in the sight of what nature has done here which, compared with the success of a few industrial enterprises, is vastly for the greater good of the greater number. . . . Mournful indeed would be a mechanical triumph over this international inspiration! "

NATIONAL SOCIETY OF COLONIAL DAMES OF AMERICA. Preservation of Niagara Falls. [Washington: Gov. print. off. 1906.] **1906** National Society of Colonial Dames of America

Petition from the National Society of Colonial Dames of the District of Columbia praying for the preservation of Niagara Falls with endorsements of several states.

Presented by Mr. Gallinger and referred to the Committee on Forest Reservations and Protection of Game, February 13, 1906. The plea is made on the ground of historical and patriotic sentiment.

Niagara again. (Outl., May 19, 1906. 83:106–107.) **1906**

Editorial comment and review of the article of H. W. Buck, " Niagara Falls from the economic stand-point; " an answer to Mr. Buck's economic argument.

1906 . . . it appears to us that the case of the power companies cannot be put more clearly and forcibly than he states it. . . .

With the frankness and exactness of a man trained to deal with scientific problems, Mr. Buck strips the controversy of its incidentals and non-essentials and goes right to the heart of the question. The transformation of Niagara Falls from a spectacle of natural beauty known and admired all over the world into a huge electrical engine whose sole function shall be to run dynamos, turn machinery, and produce metals and chemicals, "broadly speaking, is solely the physical expression of the law of supply and demand." At present the demand is such that only a part of the water of the Falls is necessary to supply it. But Mr. Buck frankly admits the indisputable fact that, if the American people decide to treat Niagara Falls merely as an economic water power, the power plants will eventually divert all the water to their use rather than fail in supplying the needs of the country for aluminum, carborundum, calcium-carbide, and other valuable products of electro-chemical processes.

1906 Niagara and the nation. (Outl., Apr. 14, 1906. 82:828–830.)

An editorial calling attention to the importance of government action and pointing out that the people are "the real owners of Niagara" and in duty bound to see to the preservation of the Falls from commercialization.

The Niagara campaign. (Outl., Jan. 27, 1906. 82:150.)

Editorial urging national and international action for the preservation of the Falls.

1906 Niagara power. (Elec. rev., July 13, 1906. 59:80.)

Notice of the Burton law then pending.

1906 Niagara problem under legislation. (Pop. sci. mo., May 1906. 68:473–475.)

A brief review of proposed legislation.

1906 Preservation of Niagara Falls. (Outl., Apr. 7, 1906. 82:772.)

A summary of the report of the International Waterways Commission.

Preservation of Niagara Falls. (Outl., July 21, 1906. 83:632–633.) 1906

Report by the international waterways commission on Niagara Falls. 1906
(Eng. news, Apr. 5, 1906. 55:394–395.)

A digest.

[A report on Niagara Falls.] (Eng. news, May 17, 1906. 55:555.) 1906

A notice of the International Waterways Commission's report.

[Saving Niagara Falls.] (Sci. Am., Feb. 24, 1906. 94:171.) 1906

A letter from an engineer opposing the preservation of Niagara for merely sentimental reasons.

STROTHER, FRENCH. Shall Niagara be saved? (Wlds. work, May, 1906. 12:7524–7535.) 1906 Strother

An able article setting forth the existing power situation at Niagara, the effects of the industrial development on the scenery, the origin of the danger from the power companies, the control of the Vanderbilt-Astor-Morgan group in the power situation, the fallacy that the people are profiting from the power franchises, the need of an international treaty to remedy matters since the economic forces of the movement toward destruction have passed out of the power of the companies to stop them.

(Two letters to the editor on the Niagara problem.) (Sci. Am., Mar. 31, 1906. 94:271.) 1906

Suggestion that the water be turned back for scenic purposes at stated intervals.

UNITED STATES.— FOREIGN RELATIONS COMMITTEE (SENATE) . . . Preservation of Niagara Falls . . . Hearings before the committee on foreign relations . . . (April 11, 1906.) (Washington: Gov't Print. Off., 1906.) 22 p. 8°. (U. S. 59th Cong., 1st sess. Senate doc. 393; serial 4015). 1906 United States Congress

UNITED STATES.— FOREST RESERVATIONS AND PROTECTION OF GAME COMMITTEE (SENATE). Preservation of Niagara Falls. Report by Mr. Brandegee from the committee on forest reservations and the protection of game, favoring H. J. res. 83, similar to S. J. res. 24, for report upon the preservation of the Falls. March 9, 1906. 8 p. (U. S. 59th Cong., 1st sess. Senate rept. 1611; serial 4904.)

UNITED STATES.— PRESERVATION OF NIAGARA FALLS CONFERENCE COMMITTEE. Preservation of Niagara Falls. Conference report on H. 18024, for control and regulation of waters of Niagara river

1906 United States Congress

[and] preservation of the Falls. (June 25, 1906. 2 p. (U. S. 59th Cong., 1st sess. House rept. 5005; serial 4908.)

UNITED STATES.—RIVERS AND HARBORS COMMITTEE (HOUSE). Control and regulation of waters of Niagara river. Preservation of Niagara Falls, etc. Report by Mr. Burton from the committee on rivers and harbors, amending by substitute H. 18024, for control and regulation of waters of Niagara river [and] preservation of the Falls. June 2, 1906. (U. S. 59th Cong., 1st sess. House rept. 4654; serial 4908.)

UNITED STATES.—RIVERS AND HARBORS COMMITTEE (HOUSE). Preservation of Niagara Falls. Report by Mr. Burton from the committee on rivers and harbors, favoring H. J. res. 83, for report upon the preservation of the Falls. Jan. 31, 1906. (U. S. 59th Cong., 1st sess. House rep't 695; serial 4906.)

UNITED STATES.—RIVERS AND HARBORS COMMITTEE (HOUSE). Preservation of Niagara Falls (H. R. 18024). Hearings [April 12–May 8] before the committee . . . 59th Cong., 1st sess. . . . Wash.: Gov't Print. Off., 1906. iv, 325 p. 8°.

UNITED STATES.—WAR DEPARTMENT . . . Preservation of Niagara Falls. Message from the president . . . transmitting a letter from the secretary of war, submitting additional information concerning the operation of the United States Lake Survey from June 29,1906, to June 29, 1911 . . . Wash. Gov't Print. Off., 1911). 22 p. pl. 4°. (U. S. 63d Cong., 2d sess. House doc. 246.)

Includes reports from the chairman of the Niagara Falls committee, F. D. Millet, dated Sept. 20, 1907, and Oct. 2, 1911.

1907

1907

The Burton bill and its effects on electrical developments at Niagara Falls. (Elec. wld. & eng., June 29, 1907. 49:1291–1294.)

The provisions of the law in regard to diversion and importation and the permits under it.

1907

The government and Niagara Falls. (Outl., Feb. 16, 1907. 85: 335.)

Editorial comment on Mr. Stetson's letter concerning private rights in Niagara Falls. To quote: "When public rights and private rights come into collision, the inevitable limitations of the latter cannot be called spoliations."

Government regulation of Niagara power. (Sci. Am., Feb. 16, 1907. 96:146.) 1907

Editorial notice of the Taft decision under the Burton law.

KOCH, FELIX J. Fleecing tourists on the grand tour at much-threatened Niagara. (Overland mo., May, 1907. 49:417–419.) 1907 Koch

Not Atlantic City in all its glory fleeces the novice more completely than does this Grand Tour.

LANGMUIR, J. W. Address before the American civic association at its annual general meeting held in Providence, Rhode Island, 19th November, 1907. (Ann. rep'ts of the com'rs for the Queen Victoria Niagara Falls park. 1907. 22:app.B.) 1907 Langmuir

A brief history of the establishment of the park together with a discussion of the policy and activities of the commissioners, especially with reference to the question of power grants and their effects upon the Falls.

Niagara: a mischievous bill. (Outl., Feb. 23, 1907. 85:388–389.) 1907

Editorial comment on the Alexander bill. It is argued that the only safety for the Falls lay in keeping the Burton law and continuing agitation for such international action as will insure permanent protection.

Niagara preservation number. (Chaut., Aug., 1907. 47:260, 277–379.) 1907

Recession of Niagara. (Elec. wld. & eng., Mar. 2, 1907. 49:421.) 1907

Editorial notice of G. K. Gilbert's work in U. S. Geological Survey (Bulletin 306), accompanied by a report on the survey of the crest by W. Carvel Hall.

The secretary of war's decision on Niagara Falls. (Elec. wld. & eng., Mar. 2, 1907. 49:414.)

Editorial on the economic and esthetic value of the Falls.

STETSON, FRANCIS LYNDE. Private rights in Niagara Falls. (Outl., Feb. 16, 1907. 85:378–379.) 1907 Stetson

A letter to the editor on the object of the Taft commission, the real purpose of the Burton act, and the effect of federal legislation on power company rights.

A wise decision. (Outl., Feb. 2, 1907. 85:236–237.) 1907

An editorial on the Taft decision.

1908

1908 American Civic Association

AMERICAN CIVIC ASSOCIATION. Niagara again. [1908.]

A letter to association members urging opposition to power grants at the Whirlpool rapids.

AMERICAN CIVIC ASSOCIATION. [Preservation of Niagara Falls.] (Clipping sheet, 2d ser., no. 6, Apr. 18, 1908.)

A second campaign to save the cataract. Esthetic considerations and other arguments for preservation presented by President McFarland of the association and Frederick Law Olmsted. Opposition urged to a projected bridge between the Falls and the upper steel arch.

1908

The beauty of Niagara and its power. (Elec. rev., June 27, 1903. 41:1098.)

A quotation from the 17th Annual Report of the Commissioners of Queen Victoria Niagara Falls Park defending power development in the park.

1908

Canadian-Niagara power. (Elec. wld. & eng., Apr. 11, 1908. 51:756.)

A review of the report of the Canadian park commissioners favoring cancellation of power franchises not yet developed.

1908 International Waterways Commission

INTERNATIONAL WATERWAYS COMMISSION. Report of the American section to the secretary of war, December 1, 1908. (Ann. rep'ts of the com'rs of the state reserv. at Niagara. 25:17–24.)

Extended extracts from the report.

1908 New York Legislature

NEW YORK (STATE) LEGISLATURE. An act to amend the public lands law, in relation to sewer through lands of the state reservation at Niagara. (Laws of 1908, 131st sess., chap. 243, p. 702.)

This amendment to the Laws of 1894, 117th sess., chap 317, sec. 92, adds to the previous powers of the commissioners of the state reservation at Niagara by granting them authority to permit the construction of a sewer in, through, under and along the lands of the state reservation, upon such conditions as the commissioners may prescribe.

1908 Randolph

RANDOLPH, ISHAN. Review of the report of William Spencer, M. A. Ph. D., F. G. S., on the physics of the Niagara river. (Ann. rep't of the com'rs for Queen Victoria Niagara Falls park. 1908. 23:5059.)

A very technical discussion.

After a review of the "conditions in that portion of the Niagara River between the point where it receives the effluent waters of Lake Erie and the first of the cascades over which it tumbles in its headlong course to the Falls," the author says "Not all of Dr. Spencer's faulty reasoning is embodied in the quotations made, but enough is quoted to bring out the fallacy of his conclusions and to enable me to demonstrate the facts to be counter to his statement of them." . . . "I have set forth the habits of obedience to the laws of hydraulics universally found among rivers. Dr. Spencer substitutes the speculations of a geologist for the deductions of the hydraulician, and reaches conclusions which do violence to all hydraulic law." 1908 Randolph

The facts set forth herein and illustrated by the exhibits prove beyond contradiction that the works of the Ontario Power Company do not tend to lower the water above the first cascade. This being true, the only water extracted for power purposes which tends to lower the water above the first cascade is taken by Niagara Falls Power Company and the Niagara Falls Hydraulic Power and Manufacturing Company on the New York side. The volume taken by the first of the companies is 8,500 cubic feet, and by the second 4,000 cubic feet or a combined volume of 12,500 cubic feet; somewhat less than the 44,750 cubic feet per second upon which Dr. Spencer predicated his argument.

That the water taken from the river for power purposes above the falls must to the degree of taking diminish the volume tumbling over the precipice is indisputable. This diminution has not as yet marred the scenic beauty of this wonderful work of nature, but the volume of diversion can not be much increased without marring that beauty. It is within the range of accomplishment to greatly increase the volume of water to be converted into power and still preserve the sublimity, grandeur and beauty of the falls and the expenditure necessary would be amply justified by the results. This is an idea which need not be amplified here but it leads up to the great question of the conservation of the waters

1908
Randolph

in the drainage areas of the Great Lakes. This conservation calls for international co-operation. In these lakes we have our seasons of surplus water and our seasons of deficient flow. The surplus is allowed to run to waste and when the low period comes there is no relief. These lakes are capable of storing all of the surplus waters and it is for man to build the works which will bring that capability into play. . . .

The author goes on to advocate the construction of controlling works at the head of the St. Mary's river and at the head of the Niagara river which would make possible absolute control of the waters so that there would be no low stage and constant mean flow could be maintained.

1908

Review of article of J. W. Spencer — "The Spoliation of the Falls of Niagara." (Nature, Nov. 5, 1908. 79:18.)

This article of Dr. Spencer's appears in the Popular Science Monthly for October, 1908.

The spoliation of the Falls of Niagara, on account of the abstraction of water for electrical and other works, forms the subject of an exceedingly interesting article in the October number of the *Popular Science Monthly*, by Dr. J. W. Spencer, who has devoted much attention to the study of rivers generally. After referring in more or less detail to the various power-stations connected with Niagara, the author notes the very great lowering of the water-level above the falls as the result of this tapping. As an example of the enormous amount of water taken by these works, it is stated that when in June last a single company temporarily stopped its take of 8,000 cubic feet per second, the water in the basin rose no less than 6 inches, and at the edge of the American Falls 1-2 inches. "The preservation of the falls," continues Dr. Spencer, "is now a question of inches. Under the conditions as set forth (i. e. as regards further tapping) the whole of the Horseshoe Falls will have shrunken from a crest-line of 2,950 feet to 1,600 feet, and their diameter will have been reduced from 1,200 to 800 feet. They will then be entirely within Canadian territory, as the boundary line will become

uncovered, leaving a narrow strip of rock between Goat Island and the great cataract. If the full franchise be used, the American Falls, which are 1,000 feet across, will have their southern half drained, and will be further broken up into narrow sheets or strings of water." The preservation of the falls, it is added, now depends entirely upon the governments of Washington and Ottawa; it is sincerely to be hoped that they will so regulate matters as to retain the world-renowned falls for all time. 1908

Scenic Niagara Falls. (Elec. wld. & eng., Feb. 22, 1908. 51:1908.) 1908

Suggestions made by Frederick Law Olmsted to Chairman Burton of the House rivers and harbors committee.

SPENCER, JOSEPH WILLIAM WINTHROP. Spoliation of the Falls of Niagara. (Pop. sci. mo., Oct., 1908. 73:289–305.) 1908 Spencer

An address before the American Association for the Advancement of Science, June 30, 1908, dealing with the physics of the river and emphasizing the importance of the "rim." According to Dr. Spencer, "the preservation of the Falls is now a question of inches," and dependent upon the action of the governments at Washington and Ottawa.

UNITED STATES.— RIVERS AND HARBORS COMMITTEE (HOUSE). Preservation of Niagara Falls (H. R. 16086 and H. R. 16748). Hearings . . . [Feb. 17, 1908, and appendix] Wash. Gov't Print. Off., 1908. 1 p. l., 19–50 p. 8°. 1904 United States Congress

1909

AMERICAN CIVIC ASSOCIATION. A Niagara emergency message for instant consideration by every member of the American civic association. (Harrisburg, 1909.) 1909 American Civic Association

A circular letter under date of February 25, 1909, urging the extension of the Burton bill.

BROADHURST, WILLIAM G. A dry Niagara — February 14, 15, 16, 1909. (Eng. news, Mar. 4, 1909. 61:227.) 1909 Broadhurst

A discussion of the effect on the power companies.

1909 The continued protection of Niagara. (Outl., Feb. 6, 1909. 91: 274–275.)

An editorial urging the re-enactment of the Burton law and commenting on the principle of restriction and the situation in Canada and America.

1909 Fourth progress reports of the international waterways commission. (Eng. news, Jan. 21, 1909. 61:84–86.)

A digest and review of the commission's report to the secretary of state.

1909 International Joint Commission

INTERNATIONAL JOINT COMMISSION. Rules of procedure of the International joint commission. Adapted pursuant to article XII of the treaty between the United States and Great Britain, signed January 11, 1909. Promulgated February 2, 1912. Wash.: Gov't print. off. 1912.

Includes the text of the treaty and laws designed to carry its provisions into effect.

1909 The waterways treaty; the Burton law, etc. (Ann. rep'ts of the com'rs of the state reserv. at Niagara. 26:16–41.)

The treaty with Great Britain for the protection of the Falls, the extension of the Burton law, the report of Brigadier General Marshall to the secretary of war, September 29, 1909, on the control and regulation of the waters of the Niagara river and the preservation of Niagara Falls.

1909 United States Congress

UNITED STATES.— RIVERS AND HARBORS COMMITTEE (HOUSE). Control and regulation of the waters of Niagara river, etc. Report by Mr. Burton from the committee on rivers and harbors to accompany H. J. res. 262. Feb. 23, 1909. 1 p. (U. S. 60th Cong., 2d sess. House rept. 2265; serial 5384.)

UNITED STATES.— WAR DEPARTMENT. National park at Niagara Falls. Letter from the secretary of war, submitting, with copy of a report of a special committee, a recommendation for the establishment of a national park at Niagara Falls. Dec. 21, 1909. 10 p., 5 pl. (U. S. 61st Cong., 2d sess. House doc. 431; serial 5834.)

1910

1910 Dow

DOW, CHARLES M. Hennepin memorial address. (Ann. rep'ts of the com'rs of the state reserv. at Niagara. 27:10–16.)

An address on the policy of the Niagara State Reservation commissioners in regard to the erection of memorials and monuments within the

reservation, delivered on the occasion of the dedication of the Hennepin memorial tablet on the state reservation, May 11, 1910. 1910 Dow

Effect of water diversion for power purposes on Niagara Falls. (Eng. news, Mar. 17, 1910. 63:306–307.) 1910

A discussion of the facts as shown by the observations and measurements of the United States Lake Survey in 1907 and 1908.

A treaty for the control of international waterways. (Eng. news, June 9, 1910. 63:661–662.) 1910

A review and digest of the provisions of the treaty.

1911

Niagara Falls from a new point of view. (Sci. Am., Sept. 9, 1911. 105:227.) 1911

Editorial comment on the hysteria over the supposed wanton destruction of the Falls. To quote: "It seems strange to me that in all this discussion we hear nothing whatever of the good to come to humanity from allowing this immense falls to work out its board and lodging."

Niagara Falls again. (Outl., Feb. 25, 1911. 97:381.) 1911

An editorial urging the extension of the Burton law.

Niagara Falls again threatened. (Sci. Am., May 27, 1911. 104:518.) 1911

Editorial comment on the changes due to diversion and on the extension of the Burton law.

Niagara in danger again. (Outl., May 20, 1911. 98:88.) 1911

Editorial comment on bills before Congress.

Preservation of Niagara Falls. (Ann. rep'ts of the com'rs of the state reserv. at Niagara. 28:10–15.) 1911

Letter of President Taft to Congress, August 21, 1911; letter of Secretary of War, Hon. Henry L. Stimson; letter from the Chief Engineers of the United States Army, Brig. Gen. W. L. Marshall, briefly summarizing the extended reports of Major Charles Keller and others.

United States.— Rivers and Harbors Committee (House). Preservation of Niagara Falls. Hearings on the subject of H. R. 26688, sixty-first Congress, second session, relating to the control and regulation of the waters of Niagara river and the preservation of Niagara Falls, held 1911 United States Congress

1911 United States Congress

before the committee on rivers and harbors of the House of Representatives of the United States, sixty-first congress, third session. Wash.: Gov't Print. Off. 1911. 2 p. l., 537–624 p., 2 pl. 8°.

UNITED STATES.— WAR DEPARTMENT . . . Preservation of Niagara Falls. Message from the president . . . transmitting information relative to scientific investigations made by certain officers of the War Department, for the preservation of Niagara Falls . . . Washington: [Gov't Print. Off.] 1911. 173; diagr., maps., pl. 4°. (U. S. 62d Cong., 1st sess. Sen. doc. 105.)

Reports by Major Charles Keller, Francis C. Shenehon and Sherman Moore.

1911 White

WHITE, ARTHUR V. The water-powers of Ontario. (*In the* Commission of conservation, Canada, Report on the water-powers of Canada. Ottawa: Mortimer co. 1911. P. 35–100,113, 354–361.)

Pp. 35–100. Deals with the establishment of the Niagara Power Union, the powers and activities of the Hydro-Electric Power Commission, the rates and amounts of power supplied under agreements made by it, discusses in detail power development at Niagara Falls and on the lower river,— its esthetic and commercial aspects, national and international legislation governing development, the franchises of the various companies, Canadian and American, the amount of power being actually developed, the general conditions governing power development on the Niagara river, its power possibilities, the power of the lower Niagara river.

Pp. 113–114. Table on power conditions at Niagara.

Pp. 354–361. Bibliography of reports relating to the Niagara river and Falls, and Index to official documents relating to Queen Victoria Niagara Falls Park. (Pp. 357–361.)

Power Development on the Niagara River

Since 1905, the general situation regarding the development of water-power on the Niagara river, and at Niagara falls in particular, has acquired a very different status from what it had before. For years the supply of Niagara's waters for power purposes was regarded as practically inexhaustible. To acute observers, however, it was evident that, even up to 1906, under the powers and privileges which had been granted to various companies in the United States and Canada, it might have become

possible for them to drain the Niagara river, and, in addition, to draw upon the waters of lake Erie. As the true state of affairs at Niagara, and the consequent possibilities became better apprehended, public opinion began to take definite form in favor of the preservation of the scenic grandeur of the great cataract. Another factor was that, in many instances where water-powers had passed into private or corporate control, there was a disposition to sell the developed hydro-electric power at a small fraction under the cost of steam, thus depriving the people of the benefits of one of their greatest natural heritages. 1911 White

Members of the American Civic Association, the American Scenic and Historical Society, the Colonial Dames of America, and other organizations were zealous in their efforts to secure the preservation of the scenic grandeur of the Falls. The efforts of such organizations in the United States and in Canada were the immediate influences which resulted in definite action being taken to preserve the Falls and the scenic beauty of the Niagara river.

General Conditions Governing Power Development at Niagara

From an economic standpoint the power possibilities of the Niagara falls and river constitute to-day the most important hydro-electric power site in the world. The process of depletion of the known coal fields of the United States — especially the anthracite coal beds of Pennsylvania — will tend, in the near future, to cause the aesthetic claims made on behalf of the scenic beauty of the Niagara falls and rapids to yield before possible aggressive demands made by companies to utilize the waters discharging from lake Erie. It is noteworthy that many of the charters already granted companies for power development are kept alive, even though, as yet, no construction works have been begun.

Marvellous is the regulated flow of water from the Great lakes, as it exists under the laws of the Creator. Referring to this natural regulation of flow, the Joint International Waterways Commissioners, in 1910, reported that "no work of man ever

1911
White

approached, or ever will approach, this perfection of regulation," and they add that man " may disturb it, making it less uniform." The conservation, therefore, of this natural uniformity of flow is a matter for national concern, and the public at large should have an intelligent appreciation of the menace that exists in unduly utilizing the waters of the Great Lakes system whether at Niagara, the Long Sault rapids, Cedar rapids, or elsewhere, for purposes of power development.

The time is coming when people will see that the amount of water which would naturally course the entire length of Niagara's bed, and which may, even temporarily, be diverted for power purposes without proving to be a serious menace to Nature's balancing of the levels of the Great Lakes, is much smaller than is popularly supposed. Some exceptional phenomena already seem to be manifesting themselves in the Great Lakes system. What may be the results when even all the water already authorized for diversion is in service, the future alone will disclose. It would be a wise precaution, when granting water privileges on a river, say, like the Niagara river, if the governments interested reserved the power to demand that waters diverted from a river must, if so required, be temporarily returned to the river. Such a course would increase the flow and thereby assist in averting critical conditions that might arise, as, for example, a dangerous ice jam which might be broken up by the agency of an increased flow of water taking place during the formative stages of the jam.

The Niagara river drains an area, including lake surface, of 254,708 square miles. The lake surface area is 87,845 square miles, making the ratio of lake to drainage area as 1 to 2.9.

In the Great Lakes system there is a regular annual variation in levels due to difference in rainfall, evaporation, and run-off, the water level being highest in mid-summer and lowest in mid-winter. The levels are affected also by the greater or less severity of the winter and by the consequent greater or less decrease in the discharging capacity of the outlets by ice. The interval of time required for an increasing supply to show its effect upon the level

of lake Erie is about 76 days, and for a decreasing supply it is about 132 days. 1911 White

The extreme variation of level of lake Erie during the period 1860–1907 is 3.89 feet, with a maximum range in one year (1892) of 2.28 feet, a minimum range in one year (1895) of .87 feet, and an annual average of 1.56 feet. The amount of water which lake Erie discharges through the Niagara river is a variable quantity and depends upon the elevation of the water surface, or, as it is termed, the stage, of the lake. For the Great Lakes system it is customary to give the stages of the respective bodies of water above a fixed datum. Mean tide water at New York is the datum usually selected.

Consider an illustration. A variation in the stage of lake Erie of a single foot, at Buffalo Lighthouse, Buffalo, corresponds to a difference in the rate of discharge from the lake of from twenty to twenty-five thousand cubic feet of water per second. The increment of discharge per foot change in stage vary for different sections of the river. They are expressed in cubic feet per second at Buffalo Lighthouse, as follows:

Stage	Increment in C. F. S.
572.67 (mean)	23,400
570–571	19,600
571–572	21,400
572–573	23,200
573–574	25,100

The knowledge such data conveys is, that if the water level of lake Erie, at Buffalo Lighthouse, for example, is 570 feet above mean tide level at New York, and the level rises to 571 feet, then the Niagara river will discharge at the rate of 19,600 cubic feet of water per second more than it was discharging at the 570 foot stage. If, next, the stage rises from 571 to 572 feet, then the discharge rate becomes 21,400 cubic feet per second greater than it was at the 571 foot stage.

1911
White

The bearing which such facts have upon the question of power development is, that the horse-power available at any specified time, at, say, Niagara falls, depends upon the quantity of water flowing in the Niagara river at that time, and, as has just been pointed out, this quantity depends upon the stage, or level, of the water in lake Erie.

In addition to the monthly, yearly or other periodic changes, variations in the level of the lake's surface, due to winds and to change of barometric pressure, are frequent and irregular, and at times violent. Variations of more than 6 inches are very common, often occurring hourly for many hours in succession, while variations of 2 or 3 feet within an hour are not uncommon. It sometimes happens that the stage varies as much as 7 or 8 feet in one day. Storms raise the water level at Buffalo several feet higher than normal, and lower it at Amherstburg, by a like amount; the difference of level between the two ends of the lake in extreme cases having been as great as 15 feet.

Discharge of Niagara River.— The discharge of the Niagara river has been determined by measurements taken at the International Bridge located at Buffalo, N. Y., and at a point about 1,800 feet down stream at the " Open Section." Measurements were begun in 1897 and are being carried on by the engineering staff of the United States Lake Survey. The maximum monthly mean discharge from lake Erie, 257,800 cubic feet per second, equivalent to a depth of 2.44 feet on the lake, occurred in June, 1876. The minimum, 168,700 cubic feet per second, equivalent to a depth of 1.60 feet on lake surface, occurred in March, 1896. The average discharge of the Niagara river during the period 1860–1907 is 212,200 cubic feet per second.

From 1860 to 1907 the greatest excess average for any one month was for June, 1876, being 45,600 c. f. s., or twenty-one per cent; the greatest excess average for any one year was for 1876, being 26,500 c. f. s., or twelve per cent; the greatest deficiency average for any one month was for March, 1896, being 43,500 c. f. s., or twenty-one per cent; the greatest

deficiency average for any one year was for 1895, being 31,800 c. f. s., or fifteen per cent. 1911 White

Power Possibilities of Niagara Falls.— Many statements of a misleading character — no doubt, sometimes, through ignorance — have been published regarding the water-power possibilities of Niagara Falls. *Theoretical* quantities of available horse-power have been presented to the attention of the public, while quantities of *actually developed* horse-power have been the units in which power companies have required their concessions from the government. Comparisons should be made with corresponding units.

Under conditions of average discharge the Niagara river, from lake Erie to lake Ontario, with its total fall of about 325 feet, would, theoretically yield about 8,000,000 horse-power. The fall in the Niagara river from lake Erie to the surface of the water below the Falls is about 226 feet, and from the head of the rapids above the Falls (forebay of the Ontario Power Company's head works) to the foot of the Falls, about 212 feet. The Ontario Power Company operates under a normal head of about 180 feet; consequently this company utilizes about eighty-five per cent of the available head of 212 feet. This is a larger percentage of the total head than is utilized by other companies at Niagara. The combined efficiency of the turbines and generators constituting the large units at the Falls is about eighty per cent, so that only eighty per cent of the eighty-five, which is sixty-eight per cent, of the possible development, is available as developed electrical horse-power. Hence, one of the first things we have to do is to cut the theoretically possible horse-power down over thirty per cent.

Again, in estimating possible available horse-power, it is customary to base the estimates upon the minimum discharge, or flow. Such is the basis employed for the estimates given in the Hydro-Electric Power Commission and many other reports. Now, if the power at Niagara falls is considered on this basis of minimum monthly discharge, then, a further reduction of twenty per cent

1911
White

must be made from the horse-power totals customarily given for the Falls based upon average conditions of flow. Hence, reducing our sixty-eight per cent by twenty per cent, we find that the developed horse-power possibly available at the Falls will be about fifty-five per cent, of the total theoretical horse-power estimated for average conditions.

It must not be forgotten, either, that it would never be possible to use all the water of the river. The ice must go by way of the Falls and not by way of the water-wheels. Just how much water must be reserved to go over the Falls in order to prevent the ice from lodging above the Falls and creating disastrous ice jam conditions, would be difficult to state. Possibly the diversions of water at present authorized may yet be found, when all is in service, to encroach upon the limits of safety.

Considered, therefore, in the most favorable light of the facts just mentioned, and from the viewpoint of the amounts of power obtained from present Niagara developments, all the mean low-water discharge, with the 212 feet available at Niagara falls, would give an estimated amount of about 2,765,000 H.P. Canada's share of this would be 1,382,500 H.P.

Let us, however, view the situation from another standpoint. It has been ascertained by special investigations made of existing Niagara plants by the United States Government, that it takes about .075 of a cubic foot of water per second, to actually develop one horse-power; even on this basis, the low-water discharge of 168,700 cubic feet per second would yield at the Falls about 2,250,000 H.P., of which Canada's share would be 1,125,000 H.P. Franchises have already been granted, and plants partially completed, for the development on the Canadian side of the river of about 450,000 H.P. In other words, instead of "millions" of horse-power being available, as has been sometimes stated, it appears that about half, and by all odds the better half, of Canada's usable share of Niagara falls power has already been placed under private control; and, as just intimated above, circumstances attendant upon the use of

all the waters now authorized may show that ice, and other conditions, preclude the use of a further proportion of Canada's equity in the waters at Niagara falls. 1911 White

We have not been dealing with theoretical quantities nor with estimates of possible actual quantities, but with quantities based upon measurements of flow and upon the percentage of the available power which the companies, who have installed operating power plants, have used under the best expert engineering advice obtainable.

Power of the Lower Niagara River.— Let us briefly consider the power possibilities of the lower Niagara river. From the head of the rapids below the Falls to the mouth of the gorge in the river there is a fall of about 94.5 feet. This is about forty-five per cent of the head available at the locality of the Falls. Assuming that as great a proportion of the available power of the rapids is used as of the power theoretically available at the Falls, and assuming further that all the water of the river is diverted, then we would have about 1,000,000 theoretical H.P. In the portion of the river in which the fall is greatest, viz., from the head of the rapids below the Falls to the foot of Foster's flats, there is a drop of 78.5 feet. This is thirty-seven per cent of the head available at the Falls. Upon assumptions corresponding to those just made above, the river would yield about 830,000 H.P., of which Canada's share would be 415,000 H.P.

Obviously the rights to the first 10,000 or 20,000 cubic feet of water diverted from the lower Niagara river are very much more valuable, considered from the physical standpoint, then the rights appertaining to any diversions that may subsequently be authorized.

The Lower Niagara River Power and Water Supply Company, incorporated under the laws of the State of New York and empowered by the State " not to take more water than shall be sufficient to produce 200,000 effective H.P.," has applied to the United States Federal Government for authority to utilize an amount of water not exceeding 40,000 cubic feet per second

1911
White

from the lower Niagara river. Reporting upon this application, the International Waterways Commission, in its report to the United States Secretary of War, states that

> "It is our opinion that about 40,000 cubic feet per second can be diverted without perceptible injury to the rapids, and that any amount greater than that will approach the danger line more and more nearly, according to its volume. We therefore recommend that no more than 40,000 cubic feet be diverted on both sides of the river taken together."

Theoretically, this recommended diversion of 40,000 cubic feet per second with the head of 94.5 feet would yield about 430,000 H.P., of which Canada's share would be 215,000 H.P. With a total head of 78.5 feet to the foot of Foster's flats, 20,000 cubic feet per second would yield, theoretically, about 180,000 H.P. Owing to the difficulties of hydraulic construction and the large fluctuations in head which occur in the lower river, it would be difficult to determine just what proportion of the theoretical quantities could be obtained from a diversion on the Canadian side of 20,000 cubic feet per second.

Power sites on the rapids below the Falls are much inferior to the power sites in the vicinity of the Falls. The Commissioners of the Queen Victoria Niagara Falls Park had a report made as to the possible power sites on the Canadian side of the lower Niagara river. This Report shows a number of possible power sites using the shortest possible tunnel routes, but the estimated total of all the reported sites is considerably under 50,000 H.P.

Summary.— In conclusion it may be said that under present mehods of development, and assuming *all the water* passing over the Falls to be diverted for power purposes, Canada's share of the power may be under 1,000,000 H.P. Below the Falls, using all the water and the total head of 94.5 feet, the lower river would yield for Canada's share about 450,000 H.P. These quantities are for the mean low-water discharge; for average con-

ditions of flow they might be increased about twenty-five per cent. 1911 White

If either Canada or the United States should first exercise its right to generate 500,000 H.P. from its share of the Niagara waters, then physical conditions might probably prevent the other country from actually developing all told half a million horsepower from the remaining available waters at Niagara falls.

WILLIAMS, C. T. [Letter on the preservation of Niagara Falls.] (Sci. Am., June 24, 1911. 104:619.) 1911 Williams

The author is industrial agent of the city of Niagara Falls. His letter cites facts and authorities to the effect that diversion has not injured the Falls.

1912

The destruction of Niagara Falls. (Metal. & chem. eng., Dec., 1912. 10:770.) 1912

Editorial on two editorials in the *New York Evening Sun* of October 25, and November 4. These two editorials call attention to the destruction of the Falls by "scenic features" and "thrillers" as compared with the destruction caused by power development.

FULLERTON, AUBREY. Repairing Niagara Falls. (Tech. wld., June, 1912. 17:435.) 1912 Fullerton

Advocates the filling of the V of the Horseshoe Falls to restore its former outline.

HAMMOND, CLARK H. State development of water power. N. Y. state conserv. dept't. Albany: 1912. 1912 Hammond

Statement of Clark H. Hammond, corporation counsel, city of Buffalo, at the joint hearing of the Senate and Assembly judiciary committees.

The "horrible waste" at Niagara. (Lit. dig., Oct. 12, 1912. 45:618.) 1912

Editorial comment on and quotation from an article in *Metalurgical and Chemical Engineering* on the economic waste of restrictions on diversion.

NEW YORK (STATE) LEGISLATURE. An act to amend the public lands law relative to constructing and operating water main along the lands of the state reservation at Niagara. (Laws of 1912, 135th sess., chap. 236, p. 451.) 1912 New York Legislature

This amendment extends the power of the commissioners as defined in Laws of 1909, 132d sess., chap. 50 (Consolidated Laws) giving them

1912 New York Legislature — authority to grant license to the city of Niagara Falls to construct and operate water mains and hydrants in, through, under and along lands of the state reservation upon conditions prescribed by the commissioners.

1912 — The preservation of Niagara Falls. (Outl., Feb. 3, 1912. 100: 257–258.)

Reasons why the Burton law should be reenacted.

1912 Yeigh — YEIGH, FRANK. The Queen Victoria Niagara Falls park. (Can. mag., Oct., 1912. 39:541.)

The value and significance of the park, and the financial policy and achievements of the commissioners.

1912 United States Congress — UNITED STATES CONGRESS — COMMITTEE ON FOREIGN AFFAIRS. Hearing: Preservation of Niagara Falls. Jan. 16, 18, 19, 20, 23, 26 and 27, 1912. Wash.: Gov't print. off. 1912.

1913

1913 — Burton act to be extended. (Elec. wld. & eng., Feb. 22, 1913. 61: 391.)

Editorial notice.

Control and regulations of Niagara river. (Elec. wld. & eng., Feb. 1, 1913. 61:235.)

Hearings of January 22 and 23 before the House committee.

The control of navigable streams. (Elec. wld. & eng., Feb. 15, 1913. 61:329.)

Editorial comment on the power of the federal government.

Governor Sulzer urges state control of Niagara water power. (Elec. wld. & eng., Apr. 12, 1913. 61:768.)

Editorial notice of the special message of the governor to the state legislature together with a digest of Attorney General Carmody's opinion.

1913 — Hands off Niagara. (Outl., Mar. 29, 1913. 103:702–703.)

An editorial urging popular pressure on representatives for the extension of the Burton act.

1913 — Niagara again in danger. (Cent., May, 1913. 86:150–151.)

A brief discussion of the fight of the federal government to save the Falls from commercialization.

The regulation of Niagara Falls approved. (Elec. wld. & eng., Feb. 8, 1913. 61:281.) **1913**

Editorial notice of federal action.

Status of the Niagara Falls bill. (Elec. wld., Feb. 15, 1913. 61: 336.) **1913**

Editorial comment on the power of the government to set a standard of efficiency in terms of horsepower per cubic foot.

Use *vs.* beauty at Niagara. (Lit. dig., Jan. 11, 1913. 46:71.) **1913**

An editorial quoting from the *New York Sun.*

1914

CAPARN, HAROLD A. Present status of Niagara Falls. (Landscape architecture. April, 1914. 4: No. 3, 81.) **1914 Caparn**

An argument for the preservation of the Niagara Falls both as a great scenic wonder and a factor in the commercial development of Lake Erie. " Nowhere, accessible to ordinary men, does so much water descend so far, producing a sight, a sound, and a splashing whose effect on normal and properly constituted people is beyond description and superior to adjectives."

DOW, CHARLES M. The State Reservation at Niagara: a history. Albany. J. B. Lyon Co. 1914 **1914 Dow**

Contents

	PAGE
Dedication	3
A Word of Introduction	7
A History:	
Chap. I. The History of the Establishment of the State Reservation at Niagara	9
Chap. II. The Policy of the Commissioners of the State Reservation at Niagara	39
Chap. III. The Administration of the Reservation in its Physical and Financial Straits	52
Chap. IV. The Reservation Past and Present	62
Chap. V. Some Legal Questions Which Have Arisen in Connection With the Establishment and Management of the Reservation	74
Chap. VI. Saving Niagara Falls	102
Chap. VII. The Existing Power Situation—Effects of Diversion	136

1914
Dow

Chap. VIII. Legal Questions Which Have Arisen in Connection With the Diversion Controversy 147
Chap. IX. The Men Who Have Made the Reservation 175
Chap. X. The Canadian Park 183
Chap. XI. Conclusion 197

We quote the final chapter of the book as giving a general idea of the story and spirit of the reservation movement.

After having read a story of achievement such as that which has been detailed in the foregoing pages, at least two questions inevitably come to mind. In the first place, one can hardly help asking whether the effort put forth has, after all, been worth while. In other words, we ask ourselves, has the work of the past justified itself in the present? And this is no sooner answered than we turn our faces the other way and ask what it is that the future has to offer. It is very natural, after having read what has been accomplished, to ask what there is still to be done, and what likelihood there is that it will be done. So a brief discussion of these questions may be in order.

It is more than a third of a century — nearly the length of an average human life — since public sentiment began to call for the reclamation of Niagara Falls from a condition which had become a reproach to the State. In the preceding pages we have described something of the strenuous campaign which was necessary to secure legislation authorizing the preservation of the natural scenery of Niagara for the benefit of the people, the long hard tug of war to secure the appropriation for its purchase, the perennial struggle to get adequate appropriations for the work of rehabilitation and maintenance, the watchful care exercised to prevent commercial intrusion, and the hard fought fight to preserve the integrity of the Falls themselves.

It is impossible to say how much money, time, and energy the preservation of Niagara Falls has cost the nation these last thirty years. Mere figures cannot measure the price. In the previous

pages we have tabulated the sums expended by the State; but these do not take into account the many thousands of dollars spent by the original Niagara Falls Association in the campaign which culminated in the creation of the Reservation at Niagara; nor do they include the money spent by individual commissioners of the Reservation since its establishment and by organized bodies like the American Scenic and Historic Preservation Society, the American Civic Association, commercial associations, and other bodies in their vigorous defense of the Falls, to say nothing of the countless private citizens who have joined in the work. 1914 Dow

Was it, is it, worth while? Worth while to spend so much money for the preservation of a waterfall? Worth while for the members of the Niagara Commission — all men of extensive affairs and pressing responsibilities in other directions — to give gratuitously to the defense and administration of the Reservation, time and attention which might otherwise be employed to their personal advantage? The answer is an unqualified affirmative. The reasons are not far to seek.

In the first place, all these sacrifices of time and money by the Commissioners and the army of citizens who have co-operated with them, have been made in response to a natural and irrepressible human instinct of the highest order, the love of the sublime and the beautiful for its own sake. Most convincing proof of this is the fact that over a million and a quarter persons go to the Falls annually — not as they go to a great city to visit museums and art galleries; not as they go to the mountains or to the seashore, to recuperate their health; not as they go to the cities and storied ruins of the old world; but simply to see the wonderful downpouring of waters which constitutes the grandeur of Niagara. The very simplicity of the fact is eloquent. That the Falls have the power to attract more than a million persons a year, not because they supply anything to educate the intellect, but just because they appeal to the human soul in a manner which, while it cannot be described, can never be forgotten — this alone is a sufficient justification for all the labor and pain and sacrifice that

1914 Dow

have gone into the making of the State Reservation at Niagara and the preservation of the integrity of the Falls.

Another evidence of the "value" of the expenditure of money and labor in the interests of Niagara is to be found in the very character of the work that has been done. It has been educational work in the highest sense of that term, for it has involved not merely the establishment of an entirely new principle in the United States but the development of a sentiment as well. Certainly, if it was worth while to blaze the way in the matter of the public preservation of scenic beauty, as the State of New York did in the establishment of the Niagara Reservation, it was even more worth while to arouse and educate public sentiment up to its present lively appreciation of that beauty. This is exactly what the fight for the preservation of Niagara Falls has very largely helped to do. How universal the appeal of Niagara is, is evidenced by the fact that never, since the establishment of the Reservation, has the expenditure made by the State been criticised. In fact, the creation of the Niagara Reservation was undoubtedly one of the most popular things the Legislature of the State of New York ever did.

The third answer to the question as to the "value" of past endeavors to protect Niagara is found in the universal uprising of sentiment against the depletion of Niagara among all classes except the commercial interests which would derive pecuniary gain from the impairment of the Falls. This evidence is entirely different from that which has thus far been adduced. The absence of protests against the expenditure of money might proceed from indifference and, in a sense, is a negative argument; but the open and vigorous protest against the depletion of the Falls is an active and positive argument. The attendance of so many visitors a year might be explained on the ground of a certain degree of self-interest or self-gratification — albeit of a very high order; but the outcry of people throughout the whole land, the majority of whom never saw, and, in all probability, never will

Falls in Winter

From a photograph. Copyrighted 1904 by O. E. Dunlap

have the indescribable pleasure of seeing, Niagara Falls, is entirely distinct testimony to the popular appreciation of the unique value of the great scene as a national possession. 1914 Dow

To the satisfaction that comes from the consciousness of work well done and well approved may, in this case, be added the satisfaction arising out of the very importance of the trust imposed. The Commissioners of the State Reservation at Niagara, as servants of the people of New York, are trustees not merely for New York and the United States but for all mankind. The realization of the extent of this trusteeship was very forcibly impressed upon the author by an incident which occurred when the Imperial Chinese High Commissioner, the Viceroy, Tuan Fang, visited the Falls several years ago. The distinguished oriental statesman viewed the various scenes about the Falls with apparent interest, but for some time with no more evidence of enthusiasm than courtesy might dictate. When, however, he came to the head of the Second Sister Island which commands a sweeping view of the tumultuous rapids above the Horseshoe Fall, his stoical reserve vanished. His emotions seemed to overpower him. He shook his own hands, raised himself several times on tiptoe, all the while uttering exclamations of the greatest delight. Asked later to write his name and a sentiment in a visitors' book, he wrote in ancient classical characters, "This is the most beautiful water landscape under the heavens."

When we compare this with the similar expression of the distinguished American author, Henry James, who said, "You stand steeped in long looks at the most beautiful object in the world;" and with the remark of another equally distinguished American author, Charles Dudley Warner, who said, "The walk about Goat Island at Niagara Falls is probably unsurpassed in the world for wonder and beauty," we realize that Niagara appeals to something which exists universally in the human breast and that it speaks in a language equally understood by all peoples.

Though the past has contributed much, it must not be supposed

1914
Dow

that the good work is completed. It is true, the principle of the public preservation of scenic beauty has been permanently established, public opinion has been quickened and elevated, and many permanent improvements of a more material character achieved; but there is, nevertheless, still a great deal to do. On the Reservation itself the work of preservation and maintenance must always go on while beyond the Reservation there is still a large field for endeavor. Only when the last untidy factory site has been harmonized with its natural setting, and every power interest has been brought to restrain itself that Niagara may be preserved, when the "Reservation idea" has been extended to include all the beauties of the Niagara river, will the work even approach completion.

It is, of course, vain to forecast the future and we shall not attempt it. It is sufficient for our purposes to point out hopeful beginnings which have been made. Preservation of the Falls is assured to the extent of the provision made by the treaty with Great Britain. The work of restoring the disfiguring sites held by the manufacturing interests along the river has also been begun.

All plans for further action are interesting chiefly for the eloquent testimony which they bear to the virility of the Niagara preservation idea which was first effectively voiced thirty years ago in the establishment of the State Reservation at Niagara. In the persistence of that idea rather than in any particular scheme, State or national, lies the hope of the future. The State Reservation at Niagara will have amply justified its continued existence and total cost, in whatever terms that cost may be measured, if it contributes ever so slightly to keep alive this Niagara sentiment, and serves as an exemplar of what disinterested and efficient public service and consistent and unselfish devotion to an ideal can bring to pass.

Summary

Early in the literature of the Falls observant travellers noticed with concern the increasing tendency to permit the use of the

power to interfere with and destroy the grandeur of the cataract and the natural beauty of its surroundings. In the second quarter of the nineteenth century these aspects became a common theme, and were soon accompanied by more or less indignant accounts of the annoyances heaped upon travellers by the hackmen and guides for the various viewpoints about the Falls. The charges of these men at this period and later were regarded as an outrage upon the travelling public. Many writers longed with regret for the days when Niagara was an inaccessible wilderness.

In the year 1879, Governor Robinson sent a message to the New York State Legislature urging the Reservation of Niagara Falls, and the New York State Survey of that same year contains the report of the special commissioners on the preservation of the scenery around the Falls. From that time on until the establishment of the New York State Reservation in 1885, the literature of the day — books, periodicals and newspapers — shows a concerted effort for the reservation and preservation movement at Niagara.

Travellers to Niagara after the work of the reservation was well under way, noted with approval the changed conditions. Disfiguring structures were removed, extortionate hackmen and guides gradually disappeared, necessary charges were regulated, and in so far as was consistent with its use as a public park the scene was restored and preserved in its natural beauty.

The laws granting and regulating the use of Niagara power are included in this chapter rather than in that on Industrial Niagara, because the state and federal regulation of such grants seems most properly a phase of the movement for preservation.

The history of the struggle between the Commissioners of the State Reservation together with various societies working always for the preservation of the Falls — with due regard for the economic interests dependent upon the power — on the one hand, and the advocates of unlimited and unrestricted use of the power on the other hand, forms a literature of its own. Enthusiasts in

the development of power even at the expense of grandeur are found among the writers of the last twenty years, but they are not so numerous as the advocates of preservation. The trend of public opinion shows clearly. Each time that privileges menacing the Falls have been sought through legislation a flood of protest has filled our newspapers and periodicals.

Chapter XII

CHAPTER XII

OPEN ROAD — GUIDES — RAILROADS — CANALS — BRIDGES

1755–1760

POUCHOT, M——. Memoir upon the late war in North America, between the French and English, 1755–60; followed by observations upon the theatre of actual war, and by new details concerning the manners and customs of the Indians; with topographical maps. Translated and edited by Franklin R. Hough. Roxbury, Mass.: W. Elliott Woodward. 1866. 2:153–156. 1755–60 Pouchot

The passage by way of the Niagara, is the most frequented on the continent of America, because this tongue of land communicates with three great lakes, and the navigation leads all the Indians to pass this place, wherever they may wish to go. Niagara is therefore the centre of trade between the Indians and Europeans, and great numbers come thither of their own accord from all parts of the continent.

Vessels cannot winter in the Niagara River, because they are continually cut by the ice coming from Lake Erie, from the month of December to the beginning of March. There might, however, be made a port of shelter on the west side at Mascoutin Point.

The river from its mouth, to a distance of three leagues above, to the place named *Le Platon*, has a channel about four hundred toises wide; the current is gentle, and it has a depth sufficient to bear a frigate as far as to the Platon, and to anchor any where along this distance. It has three bends in this course, each of a league, which gives a fine view to Niagara. The river flows for three leagues between two rocks, almost perpendicular and two or three hundred toises high, with such great force that it cannot be navigated between the Platon, and the basin under the falls. . . .

There is a wagon road from Fort Niagara to the Platon, but they generally go by water in summer. In winter they are always

1755–60 Pouchot

obliged to go by land, on account of the ice. The road from Platon to the fort at the portage, is about three leagues, which they travel in three hours. As it passes through the woods, it is sometimes muddy. If it were properly drained it would be very fine.

They have at the bottom of the banks on the Platon, three large buildings to serve as an entrepôt for goods that are being transported. The shore where they land is at least sixty feet high, and is very difficult, for they have never built anything to accommodate the landing.

The banks are three curtains, whose height from the Platon to above the banks, is equal to that of Mendon, and not steeper. There are two roads for going up; one for wagons, which is a quarter of a league longer. It has two very moderate slopes. The other is a foot path, which comes directly down the banks. This is very steep, and travelers and others who carry packs, always pass that way. They never stop to rest, although it takes half an hour to get up. There is a building for storage at the top of the banks.

The memoir of M. Belin represents this place as if it were one of the most difficult passes of the Alps, although above and below these banks there are large plains.

The fort at the foot of the portage, is only an enclosure of upright posts. They had there built some buildings for goods in transit, and for the service of the fort. It is here that they embark for Lake Erie. From this place, the river is not navigable more than a quarter of a league, and it is still necessary to be cautious not to be drawn into the current of the falls. The land around this fort is level and very good. This place is capable of having such a work as is needed.

1760?

1760? Severance

SEVERANCE, FRANK HAYWARD. The achievements of Captain John Montresor on the Niagara, and the first construction of Fort Erie. (Pub. Buf. hist. soc. 5:1–19.)

An account of the conditions on the Niagara portage.

1789

PRINGLE, J. F. Lunenburgh or the old eastern district, its settlement and early progress: with personal recollections of the town of Cornwall, from 1824; . . . Cornwall. 1890. Pp. 112. 165. **1789 Pringle**

Extracts from the journal of Miss Ann Powell who visited the Falls in 1789 and from the travels of the Duke de la Rochefoucault as quoted in Gourley's " Statistical Account of Upper Canada." On page 165 are described the postal arrangements of one hundred years ago, when not much facility was afforded for correspondence. The mail between Montreal and Niagara was sent by couriers, who travelled most of the way on foot, and took six months to make the round trip.

1791

CLARK, JOHN. Memoirs of Colonel John Clark, of Port Dalhousie, C. W. (Ontario hist. soc. Papers and records. 7:173–175.) **1791 Clark**

Written in 1860 when the writer was in his seventy-eighth year. A brief account of the visit of Prince Edward, Duke of Kent, and father of Queen Victoria, to the Falls in 1791.

I recollect my brother, Peter Clark, then in the Naval Department at Kingston in 1793, accompanied Prince Edward, Duke of Kent, and father to our present Queen Victoria, across Lake Ontario on his way to the Falls. They sailed in his boat, fitted up a little extra for the purpose, from the Government stores. They arrived safe at Niagara and were welcomed by Governor Simcoe, who paid the prince every attention his limited accommodation would allow.

From thence the party proceeded on horseback by the River Road, then partly opened by the troops.

. . . . .

On referring to my memorandum I find a further account of the Duke of Kent's visit to Upper Canada.

Our beloved Queen Victoria's father, and grandfather to the Prince of Wales, who paid us a visit in 1860, arrived from England at Quebec in the year 1791, a short time before the division of the Province of Quebec into Upper and Lower Canada.

. . . . .

1791
Clark

As soon as horses, with saddles and bridles, could be mustered, the Royal party wended their way, by narrow river road, on the high banks of the Niagara to the Falls.

The only place of accommodation, was a log-hut for travellers of that day to refresh themselves. There the Royal party alighted, and partaking of such refreshments as the house afforded, followed an Indian path through the woods to the Table Rock overlooking the Falls.

There was a rude Indian ladder to descend to the rocks below — 160 feet — which our traveller availed himself of, and after having satisfied his curiosity, the party again remounted their steeds and pursued their course back to Niagara.

1792

1792
Ingraham

(INGRAHAM, DUNCAN.) Extract from a letter from a gentleman upon his return from Niagara. (Buff. hist. soc. 15:387–393; or O'Callaghan, E. B., Doc. hist. of the state of New York. Albany: Weed, Parsons, and Co. 1849. 2:1108–1110.)

The account given in these two sources is the same although the title is different. The one in the collection of the Buffalo Historical Society describes the trip from Boston to Niagara, and the other begins the account at Albany. The extract which follows is the same in both authorities. The same letter is also cited in the collection of the Massachusetts Historical Society for 1792.

After I had reached the Genesee river, curiosity led me on to Niagara, ninety miles — not one house or white man the whole way. The only direction I had was an Indian path, which sometimes was doubtful. The first day I rode fifty miles, through swarms of musquetoes, gnats, &c., beyond all description. At eight o'clock in the evening I reached an Indian town, called Tonnoraunto — it contains many hundreds of the savages, who live in very tolerable houses, which they make of timber and cover with bark. By signs I made them understand me, and for a little money they cut me limbs and bushes sufficient to erect a booth, under which I slept very quietly, on the grass. The next day I pursued my journey, nine miles of which lay through a very deep

swamp; with some difficulty I got through, and about sun-down arrived at the fort of Niagara: Here the centinel inquired from whence we came; upon his being told, he called the sergeant of the day, who escorted us to the captain of the guard, he asked our names (a Mr. ——, of ——, was with me) and said he supposed we came upon our private business, &c.— he sent us to the commandant who entered our names, and offered us a pass to go over to the British side, which we accepted. Quite fatigued, we were happy to find a tavern, and something to eat; a few hours' sleep brought me again to myself. This fort is now garrisoned by the 5th regiment, commanded formerly by Earl Piercey, and had the honour of dancing yankee doodle on the plains of Cambridge, 19th April, 1775. The commander of the fort is a Col. Smith. The day after our arrival we crossed the river Erie to the town of Niagara where probably the British fort will be built, when the present one is given up. We met Col. B[utler]. This is the man who did so much execution in the late war with the Indians, upon the Mohawk river, Schohary and Cherry Valley. We found him holding a council with a body of the chiefs who were at Philadelphia in April last, informing him what they had done there. A Mr. Johnson, some relation of the famous Sir John Johnson, interpreter to the Indians, was also present; and I have no doubt remaining but they effaced every favourable impression made on their minds by presents from Congress. I see enough to convince me of the absurdity of our endeavours to hold the savages by presents, while the British are situated at Detroit, Niagara, &c. They have all their clothing, cooking utensils, ammunition, &c. served almost as regularly as the troops on garrison; if they want provisions they get it free.

1792 Ingraham

Those tribes called the Six Nations we are at peace with and take much pains to cultivate a good understanding, but we deceive ourselves. The old men, the women, and the children remain at home inactive, while all the young warriors join the fighting powers against us — this is all they could do, if we were at open

1792 Ingraham

war with them. An Indian becomes a miserable being when deprived of his hunting ground, and surrounded with cellars of rum or whisky. The whole Six Nations live on grounds called the State Reservations, and are intermediate spaces settled on both sides by white people; this has a tendency to drive off the game, and if by chance they kill a bear, or a deer, his skin goes at once for rum; in this way they are become poor enervated creatures. They cannot keep together a great while, and I expect they will quit all this part of the country, and retire over the lakes Ontario and Erie. Their whole number is about 6,000, of which 1,000 are warriors — how contemptible compared with their former greatness! The leading men of these Six Nations, or what they call Chiefs, were on the road with me going to Buffaloe Creek, to hold a council; their object I was informed was to use their influence with the hostile tribes to make a peace. . . .

Col. B. told me that the only way to make a peace with the Indians was to apply to Lord Dorchester, or the commander in chief at Quebec, and let him appoint some of the Commanders of the garrisons, say Detroit, Niagara, &c., to meet on the part of the British, to draw a line that shall be deemed right and reasonable between the Americans and Indians, and have the treaty guaranteed to the Indians by the British. I spurned at the idea, and told Col. Butler, that it was my wish, whenever Americans became so contemptible, that the whole country might be annihilated.

I visited the great curiosity, the Falls, and must refer you to Mr. Ellicott's account of them in the Columbian Magazine for June, 1790.

1798

1798 Weld

WELD, ISAAC. Travels through the states of North America, and the provinces of Upper and Lower Canada, during the years 1795, 1796, and 1797. Lond.: Stockdale. 1799. Pp. 308–329.

For fuller extract, see chapter II.

After we had gratified our curiosity in regard to the wondrous objects in the neighbourhood, at least as far as our time would

permit, we were obligingly furnished with a bateau by the officer of Fort Chippeway, to whom we carried letters, to convey us to Fort Erie. My companions embarked in it with our baggage, when the morning appointed for our departure arrived; but desirous of taking one more look at the falls, I staid behind, determining to follow them on foot in the course of the day; I accordingly walked down to the falls from Fort Chippeway after breakfast, spent an hour or two there, returned to the fort, and having stopped a short time to rest myself after the fatigues of climbing the steeps about the falls, I set out for Fort Erie, fifteen miles distant from Chippeway. . . . The day was by no means favourable for a pedestrian expedition; it was intensely hot, and we had not proceeded far before we found the necessity of taking off our jackets, waistcoats, and cravats, and carrying them in a bundle on our backs. Several parties of Indians that I met going down the river in canoes were stark naked. 1798 Weld

The banks of Niagara River, between Chippeway and Fort Erie, are very low, and covered, for the most part, with shrubs, under whose shade, upon the gravelly beach of the river, the weary traveller finds an agreeable resting place. For the first few miles from Chippeway there are scarcely any houses to be seen; but about half way between that place and Fort Erie they are thickly scattered along the banks of the river. The houses in this neighbourhood were remarkably well built, and appeared to be kept in a state of great neatness; most of them were sheathed with boards, and painted white. The lands adjoining them are rich, and were well cultivated. The crops of Indian corn were still standing here, which had a most luxuriant aspect; in many of the fields there did not appear to be a stem less than eight feet in height. Between the rows they sow gourds, squashes, and melons, of which last every sort attains to a state of great perfection in the open air throughout the inhabited parts of the two provinces. Peaches in this part of the country likewise come to perfection in the open air. . . . The winters here are very severe whilst they last, but it is seldom that the snow lies longer

1798 Weld

than three months on the ground. The summers are intensely hot, Fahrenheit's thermometer often rising to 96°, and sometimes above 100°.

As I passed along to Fort Erie I killed a great many large snakes of different sorts that I found basking in the sun. Amongst them I did not find any rattlesnakes; these reptiles, however, are very commonly met with here; . . .

The Seneka is one of the six nations which formerly bore the general name of the Iroquois Indians. Their principal village is situated on Buffalo Creek, which falls into the eastern extremity of Lake Erie, on the New York shore. We took the ship's boat one morning, and went over to visit it, but all the Indians, men, women, and children, amounting in all to upwards of six hundred persons, had, at an early hour, gone down to Fort Niagara, to partake of a feast which was there prepared for them.

1798 New York Legislature

NEW YORK (STATE) LEGISLATURE. An act for opening the navigation between Lake Erie and Lake Ontario, passed April 5, 1798. (Laws of 1798, chap. 93.)

The preamble states that this law is passed in response to the representations to the legislature that the construction of a canal paralleling the Falls is practicable and that it will greatly advance commerce and serve the convenience of the people of the state.

1799

1799 Ogden

OGDEN, JOHN COSENS. A tour, through Upper and Lower Canada. By a citizen of the United States . . . Litchfield. 1799. Pp. 110–112.

The author was especially interested in the Niagara portage, but attempts no description of the Falls.

The noble river St. Lawrence supplies this country for an extent of two thousand miles, with commercial advantages inferior to none on this side of the Atlantic.— Conceive to yourself vessels of six hundred tons burthen, unloading all kinds of British goods at the port of Montreal, five hundred miles from the sea, and again receiving in return, furs from the interior parts of the country as far as the Mississippi is known to the westward, and

the waters emptying into Lake Superior from the northward.— This town, when the banks of the different lakes and rivers are settled by husbandmen, which is at no distant period, must have a vast increase of trade, for without doubt all British manufactures, thro' these vast water communications, will come much cheaper, through the whole course of its windings, than can be afforded from any other quarter. Goods on importation being liable to no duty, which will undoubtedly give this country a vast advantage over the new settlements that I have described in my former letters; indeed nature points out this place as the emporium of trade for the people inhabiting both sides of these lakes and rivers emptying into them as far as they extend to the west. From Montreal, *boats* called by the Canadians batteaux, containing twenty-five barrels bulk, are worked by four men to Kingston, a distance of nigh two hundred miles up the river in the course of six or eight days, and again return in three, loaded with furs, potash, and other produce of the country.— Vessels, generally schooners, receive the goods at Kingston, and convey them in a short time, to the landing at Queenston, below the great falls of Niagara. Here the portage gives employment to a number of teams in transporting them to Chipawa as before described; — they are again received at Fort Erie in vessels of the same burthen as formerly, which navigate all Lake Erie, Huron, and Michigan. The expences incurred during all this rout are comparatively trifling, as you will observe there is but one portage, and that only ten miles in the course of this communication. And when one reflects on the temperate climate, rich soil, and other natural advantages of this interior country, you anticipate a great population in a short time.— The streights of Niagara, from its peculiar situation, being the channel through which all the produce of the vast country above must pass, is looked forward to as a place of the first consequence, and where a farmer will at all times find a market for his produce, the transport being easy from thence to the Atlantic.

1799 Ogden

1799 Williamson

WILLIAMSON, CHARLES. The Falls of Niagara. 1799. (Mag. of Am. hist., July, 1880. 5:54–56; *or* O'Callaghan, E. B., Doc. hist. of the state of New York. Albany: Weed, Parsons and Co. 1849. 2: 1165-1167.)

The author was an English land agent in Western New York. His account is especially interesting for the light it throws on travel conditions at the close of the eighteenth century, and the difficulties attending a trip to Niagara Falls.

1800

1800 Maude

MAUDE, JOHN. Visit to the Falls of Niagara in 1800. Lond.: Longman, Rees, Orme, Brown and Green. 1826. Pp. 159–165.

The Niagara is not navigable higher than Queenstown, consequently there is a portage from this place to Chippawa, which employs numerous teams, chiefly oxen; each cart being drawn by two yoke of oxen, or two horses. I passed great numbers on the road taking up bales and boxes, and bringing down packs of peltries. Fourteen teams were at the wharf waiting to be loaded. Here were also three schooners. . . .

. . . . . .

The Whirlpool abounds in fish; never freezes; and has generally its surface covered with logs, trees, ice, and such other floating substances as it draws within its vortex.

. . . . . .

Queenstown contains from twenty to thirty houses, whose fronts are E. and W. the worst possible aspect, but which has been regulated by the course of the River, which is from S. by E. to N. by W. very rapid, and full of eddies.

On the side of the River opposite to Queenstown, the Government of the United States design to establish a Landing; or rather, renew the old Portage to Fort Schlusser. There are at present only two houses there, one of which is the Ferry-house; a road being opened from this place to Tannawantee, distant only thirty miles.

Another scheme of the Anglo-Americans is, to do away the necessity of a Portage, by substituting a Canal in its place: this object can be best explained by a quotation from Captain

Williamson's Account of the Genesee: — " The Fall was found to be three hundred and twenty feet from Steadman's Landing (Fort Schlusser) above the Falls, to Queenstown Landing below: the distance to be cut (for the proposed Canal) did not exceed four miles, nearly three of which is on a level with the navigable part of the River above the Falls." 1800 Maude

To judge from Captain Williamson's description, the construction of this Canal would be a trifling labour: he has, however, forgotten to mention, that these four miles are to be cut through a limestone rock, full of fissures, which would make it necessary to line the Canal with tarred plank, or other materials impervious to the water.

For more extended extract by same author, see chapter II.

1807–1808

SCHULTZ, CHRISTIAN. Travels on an inland voyage through the states of New-York, Pennsylvania, Virginia, Ohio, Kentucky and Tennessee . . . 2 vols. N. Y.: Isaac Ripley. 1810. 1:58–59. 1807–8 Schultz

From Niagara we proceeded up the river to Lewis Town, on the left bank, a new settlement of about a dozen houses, so called in honour of his exexcellency Governor Lewis; but, as his sun of glory has set, the inhabitants talk of petitioning the legislature for leave to change its name! Immediately opposite to it lies Queen's Town, a village of Upper Canada, containing about a hundred houses, and a small garrison of twenty-eight men. Both these towns are situated at the head of the navigation of Niagara River, and each has a carrying place round the falls; that on the American side, however, is the best, and two miles the shortest. The freight and passage are the same, whether you land here or at Niagara.

The rapids commence about a quarter of a mile above these towns, and continue with increasing and irresistible force for nearly eight miles, up to the foot of the falls.

The State of New-York has granted the exclusive right to Porter, Barton & Co. for a term of years, of the site of old Fort Schlosser, which is the landing place on the American side, upon

1807–8 Schultz condition that they should build store-houses at Lewis Town, Fort Schlosser and Black Rock, on Lake Erie, which they have done. The portage for salt and other articles was formerly principally upon the British side; but, since the present arrangement, the whole of the portage is on the American side. Add to this, that there is now much greater security in transporting goods than formerly, as this company are bound not only to have all perishable articles housed and stored, but are even answerable for the safe delivery of whatever is committed to their care. The portage is thirty-seven and a half cents a barrel to Fort Schlosser, and merchandise at the rate of twenty-five cents per hundred. The distance is seven miles.

1808

1808 T. C. T. C. A ride to Niagara. (The portfolio, July, Aug., Sept. 1810.)

This excellent account of a trip from Williamsport, Pennsylvania, to Niagara in the year 1809 is also bound as a pamphlet in the Marshall Collection of the Buffalo Historical Society. It contains much valuable information not only of the conditions of travel for that time but also accurate knowledge of the conditions of the country and the towns through which the author passed. It also contains a good map showing the roads and the settlements.

Mr. Oldschool,

Finding myself at Williamsport, in Lycoming county, about the beginning of May, 1809, and having a month to spare, I determined to take a ride to the Falls of Niagara. I had visited the Genesee country and the Falls of Genesee in the year 1796, but notwithstanding the four years' exertions of captain Williamson, the Genesee was at that time almost a wilderness, and I was not tempted to go further westward than the mouth of the river. It is now a very populous and well cultivated country, considering the short period of its settlement, and every year lessens the inconveniences attending so interesting a jaunt. Travellers, who, like myself, ride post through a country, have seldom much accurate information to give; but as I think the tour will yearly become more fashionable, because it deserves to become so, I send

you the observations that occurred to me on the route. Even the designation of stages and the names of taverns, will not be without their use to persons in this state, who have leisure and curiosity to visit an object so remarkable as Niagara Falls. At any rate, the following notes will form a tolerable register of the *present* state of the country. I wish we had such, imperfect as it is, of every part of the United States. 1808 T. C.

T. C.

Itinerary.

I set out from Williamsport on Saturday the sixth of May, 1809, in the afternoon, and went to (14 miles) Reynold's, a good tavern. Here the tolerable road ends.

15[1] Sunday 7th, to Higley's at the block house, along a villainous road, nearly impassable for a pleasure carriage.

10 To Bloss's at Peters's Camp: a very bad road through a very improvable country. Iron ore and bituminous coal found within a mile and a half of his house; the iron ore not rich, nor the vein of coal thick. A miserable habitation, but civil people.

9 To Jenyns's: a house to bait at only.

10 To widow Berry's: tolerable accommodation. The bottom lands of the Tioga are almost all of them in the incipient stage of improvement. They are as yet chiefly settled by half share intruders, who are gradually becoming tired of their illegal and precarious title. The flats are not wide, but the land is very rich.

8 Monday, may eighth, crossed the Tioga and the Canisteo or Canister, to judge Linby's, about a mile over the state line: at the state line the road, from being execrable through Pennsylvania, from Reynolds's, (I may indeed say from Williamsport, considering the frequent crossings of Lycoming Creek) to the boundary line of the state, becomes suddenly pleasant and good. I do not now recollect how many times a traveller has to

[1] The figures at the beginning of the paragraphs denote the number of miles from the place mentioned in the preceding, to that in the paragraph at which the figure is placed.

1808 T. C.

pass Lycoming Creek, and Trout Run, and the Tioga, and the Canister in the last fifty miles; but there cannot be less than between forty and fifty fordings altogether; I believe the latter number is nearest the truth. And yet the greater part of the road passes through or in sight of very good land. Between Reynolds's and judge Linby's, I met with no hay.

12 To Irwin's at the painted post: through a good country, along a good road, to a tolerable tavern.

12 To doctor Falkner's, who keeps tavern at Mud Creek. . . .

6 To Bath, to William Spring's tavern. This is the county town of Steuben. It was the scene of the Genesee speculations so much encouraged by captain Williamson. It is situated in a high cold climate; almost surrounded by mountains; on a meagre, barren, siliceous soil. It contains even now, although the first town built by and the favorite residence of captain Williamson, but thirty houses. Captain Williamson's old house, a mile before you reach Bath, with eight hundred and forty-six acres of land, four hundred of which were cleared and improved, and sixty of them meadow, sold lately to a Mr. Hopkins for nine thousand dollars. The buildings alone cost captain Williamson at least fifteen thousand. Goods are purchased here chiefly from Newyork, which, as a market, is upon the average about one-sixteenth cheaper than Philadelphia. The price of carriage hither is about the same, viz. two dollars and twenty-five cents per hundred weight; but the road to and from Newyork is much the best. I staid here on business part of Tuesday, May ninth, and in the afternoon went on to Terples's (twenty miles). He is the sheriff of the county, and keeps a tolerable tavern. Very bad road from Bath hither.

Wednesday ninth, rain. In the afternoon to Rice's (eleven and a half miles) at Snell's town, nicknamed Pen Yang, from its being originally settled by Pennamites and Yankees in about equal proportions. This is a poor place and a very middling tavern. It is on the outlet of the Crooked Lake where there

is an excellent mill-seat. I heard of limestone about nine miles from Terples's near to the bank of the Seneca Lake, but I saw not a particle of that stone on the whole road from the mouth of Loyalsock till I came here: an extent of ninety-four miles. 1808 T. C.

Thursday May 11. To Powel's at Geneva (fifteen miles). About one hundred houses; a place of much trade. A delightful street on the bank of the lake: the houses of frame, well painted, clean, cheerful, with a full view of this charming lake in front. Geneva is built on limestone, which I suspect extends all the way up the Seneca Lake to Catharine's Town, if not in a continuous stratum, in hills and nodules. Powel's tavern was built by captain Williamson. It might be kept cleaner and neater than it is. I guessed it at fifty feet square withinside. . . . Instead, therefore, of going the direct turnpike road to Canandaigua, (pronounced Canadarque) sixteen miles, I went the Sulphur-spring road.

9 To Sterne's tavern: walked to Dickson's mill and house, . . .

3½ To Powel's at the Sulphur-springs. This is the brother of Powel at Geneva, a civil obliging man. The place is dreary, but the house large, though unfinished. It was intended as a kind of watering place, . . . There are two or three sulphur springs hereabout, but Powel's is the largest and most saturated. . . . I gave for a bottle of London porter (so called) at Powel's five shillings York money: probably the people, who would otherwise resort here, find the living somewhat too expensive. An assessor here informed me that the lands of that township were rated one with another in the tax books, at twenty-two shillings and six pence, York currency, per acre.

10 To Taylor's at Canandaigua: a good tavern. Canadarque consists of one street extending from the lake. It contains from ninety to a hundred frame houses, generally speaking, neat and elegant in their external appearance; a meeting house and a court house. It is indeed a very handsome town. There are two potash works here. About eight lawyers, for this is the

1808 T. C. county town of Ontario. The agriculture of the neighborhood is probably improving, for I observed in one of the newspapers (there are two published here) forty halfblooded Merino lambs to be disposed of at Palmyra by William Howe Cuyler. The house and lot of forty acres in this town formerly owned by Mr. T. Morris, sold to the present occupant, Mr. Clarke, a tanner, for seven thousand dollars. In the time of Mr. Morris it was, in good truth, a hospitable mansion; and then, the only house in the place of genteel appearance. At present there are twenty as good.

10 Friday, twelfth, to Eccleston's.

2 To Hall's; the more frequented of the two.

12 To the widow Berry's, about half a mile on this side the Genesee river. This is in Hartford. From Canadarque hither, you pass through Bloomfield and Charlestown townships. It is one village all the way from Canadarque; at least you are scarcely ever out of sight of a house. In Bloomfield I saw two brick houses, one brick store, and one brick meeting house. My memory does not serve me to recollect any other from Williamsport hither, but log and frame buildings. In Pennsylvania, on this route, you see log houses; in Newyork state, frames. . . . From Canandaigua hither the stone on the road is round siliceous pebble, siliceous grit, chert, chert-flint, flint occasionally by itself, and sometimes imbedded in limestone, chert intermixed with limestone, and here and there limestone, in proportion of perhaps one-fourth of the whole number of stones. For a mile before you come to the Genesee river, the road is made chiefly of gravel formed of compact siliceous stones.

4 Across the Genesee river. Passed the Indian village of Canewagas. This tribe has reserved about two miles square on the river. It began to rain, and I was compelled to put up for the night at a tolerable tavern kept by a major Smith.

12 Saturday, May thirteenth, to Marvin's; tolerable house. Very poor cherty land for five miles from Smith's.

8 To Keys or Kyes at Batavia. Excellent land and well

settled for the last eighteen miles. The road tolerably good. 1808
Limestone and chert all the way. The country is very level, and T. C.
as well fitted for a Batavian as any I know of.

Batavia contains two taverns, (another is fitting up in the court house) two stores, and about a dozen houses. One of them is the land office of the Holland company for the disposal of the three millions of acres purchased of the late Robert Morris. This is under the care of Joseph and Benjamin Ellicot, brothers to Andrew Ellicot of Lancaster, one of whose sons has a mill here in the town upon the Tonnewanta creek.

All the Holland company's lands hereabouts (ninety-four miles one way by about as much in the broadest part the other way) have been accurately surveyed under the direction of the Ellicots, who have laid down connectedly on a large scale every tract, on one large map divided into three parts. Each part is attached to rollers and inclosed within a glass sash frame, so that by turning backward or forward the roller containing the survey required, you find in a minute's time any particular tract, its courses and distances, and a reference to the field notes containing the quality of the land and its timber. All the field books are half bound and numbered, and the notes appear to be judiciously taken; so as to enable the company to judge of the comparative value of each tract. The rollers appear to me to be about eight or ten feet long each, and the tracts very neatly and accurately laid down. . . .

The common selling price of land in the Holland purchase is from two to four dollars an acre, long credit. At first they took payment of the instalments in wheat, at present they demand cash. Mr. Joseph Ellicot, I hear, means to remove his office to Buffaloe, recently named Newamsterdam. The company has erected, at their own expense, at Batavia, a court house, a gaol, and a hotel, all under one roof. The outside is airy and neat, but the inside is neither elegantly nor commodiously distributed for any of the purposes intended. They make good beer in Batavia, at five dollars the thirty-three gallons; chiefly from wheat.

1808
T. C.

10 To Goss's, to feed: a poor place. Richardson's, a mile further, seems somewhat better.

3 Carr's saw-mill on Murder Creek. The stone all chert. The limestone appears to decrease in quantity.

5 To Van Deewinder's, a frame house, the only place between Batavia and Buffaloe where you can sleep, and bad enough it is. The road from Batavia hither is very full of stumps and swamp holes; three-fourths of it consists of log causeways. There is a log cabin about every mile or two. It is much the worst road I have met with from the state line hither: it is much the same as the road from Lycoming Creek past the block house and Peters's Camp to Tyoga, only the Holland company have taken somewhat more pains than the state of Pennsylvania.

14 Sunday, May fourteenth, to Ransom's for breakfast; fried veal: the only fresh meat, except some beef at Canadarque, that I have seen since I left Williamsport. Nor has my horse had hay more than once since I left Reynolds's, the first stage from Williamsport. They attribute the want of it to a winter unusually protracted.

8 To Landen's at Buffaloe, a village of about sixteen houses near the outlet of Lake Erie on the lake. From Van Deewinder's here nothing but chert along the road, but Landen says they have plenty of limestone upon the hills about three miles off. Landen's is but an indifferent tavern, though the best in the place. Buffaloe appears very well situated for business with Erie, Detroit and the western part of upper Canada, but there are, as yet, no symptoms of industry. Landen tells me that the whole road round the lake to the town of Erie in Pennsylvania, ninety miles off, is well settled except about nine miles. I asked him where was the market for the produce of that part of the country? he replied, New Orleans, by the Chatangue Lake, there being but nine miles of land carriage from Lake Erie to New Orleans, to wit, the Chatangue portage, which is true. But, in my opinion, the market will be Montreal, for there are not more than nine miles portage from Lake Erie to Montreal, to wit, at

Queenstown, and, as I think, the navigation is not only very much shorter, but much easier. For when the lake salt is four dollars and fifty cents at Buffaloe, it sells at ten dollars at Pittsburgh; hence, allowing a dollar per barrel profit, the carriage from Buffaloe to Pittsburgh will be five dollars by water. I believe land carriage is now about six dollars per hundred weight from Philadelphia to Pittsburgh. The ice was very thick in Lake Erie. 1808 T. C.

3 To Millar's ferry along the bank of the lake. If it be no object to call at Buffaloe, there is a road turning to the right, about two miles from Buffaloe, which leads directly to the ferry, and saves that distance. The stone that bounds the river here is a mass of black chert. I arrived about twelve o'clock, but the ice was so thick in the river Niagara that it was impassable till three. There were three wagons of emigrants waiting to cross to the British side from Shoharie in Newyork state, and Buffaloe in Northumberland county, Pennsylvania; they were chiefly Germans. They expected two hundred acres of land to cost them about fifty dollars; I understand the British government sells it at forty dollars per two hundred acres. The American emigrants to Canada generally complain, as I heard, of the violence of party politics in Newyork state and in Pennsylvania. The taxes in Canada are very light, but unequal. The crossing here is three-fourths of a mile over; price half a dollar for man and horse. They catch abundance of fish in the spring with a seine. The family were dining on pickerell and salmon trout, each about four pounds weight.

15 To Chippeway: a house every three or four hundred yards all the way. An excellent road through good land. Chippeway contains about ten houses. There are two good taverns, one kept by Stevens, the other by Fanning. Stevens being the nearest and the newest I stopt there. They are of equal repute. Each has a new part connected with the old building, and each has eight windows in front. The diningroom at Stevens's is twenty feet by thirty, carpetted. The attendance good, and the

1808 T. C. people civil. For a pint of tolerable Teneriffe, a gill of rum, supper, breakfast, bed, and feed for my horse, I paid only thirteen shillings and six pence York money. There had been a handsome bridge over the Chippeway, but the middle part was broken down, and they now ferry across. On the opposite side to the taverns, is a fort with a lieutenant's guard. The waters of Chippeway are dark coloured owing to its running for near thirty miles through a swamp. . . . But my landlord, Stevens, could give me no information; nor would he take the trouble of giving me any particular directions as to the proper means of seeing the falls to the best advantage. "They are by the road side, you cannot miss them."

Monday, May 15, to the falls of Niagara. Opposite Chippeway, the river seems to be about a mile and a half across. At the falls it is contracted and divided by an island into two main cataracts, the one near the British, the other near the American side. The road runs along the brow of a hill, and as you pass along at about two miles distance from Chippeway, you observe a wagon road descending to the right into some flats washed by the rapids of Niagara. The descent may be eighty or ninety feet. The flats are very narrow, but there are four or five buildings on them, a mill, a tannery, &c. At any of these you can procure a person to walk with you half a mile to the Table Rock, over a part of which the river rushes and makes the great fall. Ten dollars would make this a good horse road; at present you have to wind through the bushes very uncomfortably. The tavern-keepers at Chippeway ought to feel it their duty to make the walk as comfortable for the ladies as possible, and a trifle would make it so. When you get on the edge of this limestone flat called the Table Rock, you have before you a full and complete view of an amphitheatre of about half a mile in circumference; comprehending close to your right two-thirds of the river Niagara, after rushing along in broken and foaming rapids, precipitating itself into a chasm beneath your feet, exactly one hundred and fifty feet deep. The falling

water projects far enough to admit you to see a considerable way between the rock and the main sheet, and affords room enough for those who wish to descend, to go behind it. This is owing to a projecting ledge of the rock over which the water is precipitated. Opposite to you, at the distance of somewhat less than a quarter of a mile, you see the river broken by a finely wooded island; and the rest of this immense body of water, rushing down into the farther part of the chasm below, on the American side. 1808 T. C.

The roaring and foaming of the rapids for near a mile in full view before the river arrives at the precipice; the green tint of the water, edged all the way down by curling folds of snow white foam; the immediate chasm of boiling snow into which the river pours; the mist that eternally hovers over the gulf below, and through which you see at intervals the turbulence of the bottom; the trees of the island which divides the falls, and which seem to descend even below the edge of the precipice itself; the immense interminable mass of wood, which fills the whole of the surrounding country, and borders to the very edge, every part of the watery prospect; and the rapidity with which the green and white current below drives along as if in haste to escape from the horrible chasm in which it had been ingulfed, form altogether a scene of grandeur and of beauty, unrivalled. I felt content that I had taken the journey. It was worth the trouble.

After having sufficiently contemplated the scene before me, I was satisfied that I could well dispense with my intended tour to the American side; and also with the troublesome descent down an unsafe ladder half a mile off, and a walk of near a mile over the rough rocks at the bottom, to get at the view below, and behind the sheet of water. It appeared to me that every thing that was worth seeing, might be seen in safety and in comfort from the Table Rock; but those who have more youth, more leisure, and more curiosity than I had may like to see *all* that is to be seen. It is unpardonable in the tavern-keepers at Chippeway, whose establishments are to be maintained by the con-

1808 T. C. course of travellers, who come expressly to see the falls, that they do not provide at least a sound and safe ladder, and expend twenty or thirty dollars in laying the stones at the bottom in such a manner as to enable the female part of the visitants to contemplate the scene under the Table Rock, if they wish so to do: at present it is an undertaking too arduous and fatiguing for the female sex.

Those who wish to descend will be directed to a house about half a mile from the flats, where a ladder is kept for the purpose. When I was there nobody had gone down it since the preceding season, and I was advised not to try; an advice which I readily complied with. From the flats where the habitations are, you can ascend again into the main road, which I think is about eighty or ninety feet perpendicular above the edge of the water. This, therefore, is the descent which forms the rapids of the river, before the perpendicular fall of one hundred and fifty feet commences.

When you have again got upon the high road by an ascent at the further end of the flats, you see about a hundred yards before you a house, with a field before it, fenced with a worm fence. It is now occupied by Charles Wilson, but has lately been sold to a Mr. Shannon. Do not go so far as the house, but skirt round the fence, and in about one hundred and fifty or two hundred yards, you will see two or three knolls or prominences on which you may again take your stand, and have perhaps a still more complete view of the whole scenery than from the Table Rock. There is an oak tree on the best brow that I found for the purpose, on which about four feet high I cut a small blaze with my penknife. A small island in the river on the American side, in the midst of the falls on the American side; a mill seat in the distance; and the beauty of the smaller fall which is made by that island, are objects worth noticing, as adding to the picturesque of the scenery, after you have sufficiently contemplated the grand whole. I gave the man who went with me from Hardie's, the tanner, half a dollar, with which he was well

content. He told me that land thereabout, unimproved, sold from three to four pounds sterling an acre, not far from the road, prime land. Hardie (a civil man) emigrated fifteen years ago from Lewistown, on the Juniata, before Mifflin county was struck off from Cumberland. I mention this because I saw neither actual improvement in his situation, nor any means of improvement that might not have been made or obtained in the place he left. 1808 T. C.

I intended originally to have gone from Buffaloe up the American side, to Schlosser's, but Landen at Buffaloe informed me, the road was impassable. However, persons had been appointed to put it in order, and he was one, and about to set to work the next day, so that in a week or two it would be good. From Schlosser's northward to Lewistown there is a road, which forms the portage on the American side round the falls of seven miles, and thence from Lewistown to Niagara fort, a tolerable road of six miles. The river makes a bend toward the British side, so that the portage round the falls there is nine miles. The country on the American side is good and will admit of thick settlement, but there are very few settlers from Niagara fort southward to Buffaloe. I cannot help thinking it would be well worth while to force a settlement along that frontier.

4½ Inquire for John Thompson's house; it is a mile and a half off the road. You go past one Bateman's on the left hand of the road, where you may get some person not merely to direct, but to go with you to Thompson's, which is a good stone house near the river. At the back of his house there is a stony field, full of cedars and white pine; go to the bank, and you see a place they call the whirlpool, which is a truly picturesque scene. The river seems at least one hundred and fifty feet below you; narrow, rapid, foaming; in its haste it drives against a bay which forms nearly a cul de sac; this occasions an eddy, which they call the whirlpool. On some days it is comparatively still; on others it roars as loud as the great falls, and may be well heard at three and four miles distance. It is an object not to be passed on such a tour. Volney notices it, but I had not Volney with me, and

1808
T. C.

I had forgotten it. I heard of it by chance, from my conductor at the Table Rock telling me of some one who lived near the *whirlpool*. A traveller must inquire for himself, he can not count upon being told of anything worth seeing at Chippeway. The man who conducted me was a German; he had lived for some years thereabout as a farming servant, at six dollars per month and board, which I mention as an item of the price of labour.

1½ Returned from Thompson's to (three miles) Queenstown. This is situated at the bottom of the hill; that is from one hundred and fifty to two hundred feet below the road which leads from Lake Erie. This road has a gentle descent all the way from Lake Erie hither; but here it falls abruptly into a bottom thus much below its own level. It is highly probable that at some far remote period, the great falls were at this place; for here is the commencement or the termination (call it which you will) of the higher level. The river here begins to widen, and admits of being ferryed; but even the ferrying place has several eddies in it.

Queenstown is a pleasant village of about sixteen or eighteen houses. I stopped at Banister's, a civil man, from Massachusetts. I got a pint of excellent port, which *more majorum* I find to be the fashionable wine among the Anglo Canadians.

This is a place of trade, being the commencement of the portage round the falls. Banister pays about twelve shillings sterling a year for direct taxes of all kinds. The military and judiciary are paid by the crown. Judge Hamilton, who died lately, and had very large property, was assessed at no more. The imported goods come by way of Montreal. For tea they give one dollar and a half per pound, loaf sugar three shilling (Newyork currency). For my wine he charged me five shillings, but it was good. At Batavia I got Mr. Ellicott to change my Pennsylvania notes, for the notes current in Newyork state; but I found notes of no kind current in Canada. They trade for coin. They have no bank; and they dislike our notes. No wonder.

CAVE OF THE WINDS

Beneath the Falls in winter

After dinner I rode (eight miles) to Newark, Fort St. George. 1808
The road excellent. The ride along the Niagara beautiful. The T. C.
country well settled. In fact it may be regarded as a continued village from the ferry opposite the Black Rock for thirty-three or thirty-four miles down to Newark. I stopped at Emery's, a very good tavern. I wished to see Captain Lee who is collector at the American port of Niagara; but no ferry is kept at either place. I hired a boat for the purpose. . . . I was sorry to see the American town and fort of Niagara, so inferior in external appearance, at least, to the British town of Newark and Fort St. George.

This being the extent of my proposed journey outward, I returned (eight miles) to Banister's at Queenstown, where I slept. By his persuasion, and it being also a new route, I determined to go by Lewistown, (a shabby American settlement opposite Queenstown.) I arose, therefore, at five o'clock, and crossed the ferry to Lewistown. . . .

1811

MELISH, JOHN. Travels through the United States of America in 1811
the years 1806, 1807, and 1809, 1810, and 1811 . . . with corrections Melish
and improvements till 1815 . . . Phila. and Lond.: 1818. Pp. 503–509.

The road (on the Canadian side) proceeds along the bank of the river, and is elevated above the water seven or eight feet. On the British side there are rich settlements, all the way down, and I learned that the inhabitants are chiefly Germans, from Pennsylvania. On the American side are very few settlements, but they have *commenced*, and it is supposed they will go on very rapidly.

The account is accompanied by a queer stereotyped general plan of the Falls of Niagara.

1814

WRIGHT, FRANCES. Views of society and manners in America: in a 1814
series of letters from that country to a friend in England, during the years Wright
1818, 1819, and 1820. Lond.: Longman, Hurst, Rees, Orme and

1814 Wright

Brown. 1821. Pp. 237–246. *Also* N. Y.: E. Bliss and E. White. 1821. Pp. 173–180.

An exceedingly interesting account of the journey from Lewiston to the Falls. Even more illuminating, perhaps, is the account of the stage trip from Rochester along the ridge road to Lewiston. Miss Wright was observant of the country and the condition of the people.

The cataract is graphically described, the language is well chosen, the description sympathetic without being rhapsodical.

1816

1816 New York

New York (State). Memorial of the citizens of New York in favor of a canal navigation between the great western lakes and the tide-waters of the Hudson. N. Y.: Samuel Wood and Sons. 1816.

A discussion of the Hudson River and St. Lawrence routes. Objections to a Niagara canal. Drafted by De Witt Clinton.

New York (State). Memorial of the citizens of New York in favour of a canal navigation between the great western lakes and the tide-waters of the Hudson. (Pub. Buf. hist. soc. Vol. XIII. 1909. See index for references.)

1817

1817 Langslow

Langslow, Richard. A Niagara Falls tourist of the year 1817. (Pub. Buf. hist. soc. 5:111–133.)

The journal of Captain Richard Lanslow of the Honorable East India Service, giving a full itinerary of the journey. There is no attempt to describe the Falls, but there is much concerning the travel conditions of the time.

1818

1818 Howland

Howland, *Mrs.* Sarah Hagard. Extracts from the tour of Sarah Howland, and some of the poetry, letters, and other papers preserved by her, together with some account of her family compiled by her great grandson, Howland Pell. (N. Y.?) 1890.

An account of a journey from New York to Niagara Falls by carriage in 1818. The trip took two months. There is a chronicle of various stops on the journey, but no detailed description of the Falls, which were visited on July 15 and 16.

1821

1821

The fashionable tour; or, A trip to the Springs, Niagara, Quebeck, and Boston, in the summer of 1821. Saratoga Springs: G. M. Davison. 1822. Pp. 99–110.

1822

POOLE, STANLEY LANE. The life of the Right Hon. Stratford Canning, Viscount Stratford de Redcliffe . . . Lond.: Longmans, Green. 1888. Vol. 1. Pp. 331–334. 1822 Poole

No description of Niagara, no word about it, in fact, except that it is there, but much interesting detail concerning the journey thither, the progess of settlement, and the opening of the country.

1823

NEW YORK (STATE) LEGISLATURE. An act to incorporate the Niagara canal company. (Laws of 1823, chap. 132.) 1823 New York Legislature

Regular act of incorporation.

1825

The fashionable tour in 1825. An excursion to the springs, Niagara, Quebec and Boston. Saratoga Springs: G. M. Davison. 1825. Pp. 119–124. 1825

GILPIN, T. A northern tour . . . Phila.: Carey. Pp. 145–150. 1825 Gilpin

(A) northern tour; being a guide to Saratoga, Lake George, Niagara, Canada, Boston, etc. . . . Phila.: Carey and Lea. 1825. Pp. 147–150. 1825

Little resemblance to a guide-book. Interesting and sympathetic description. A discussion as to the correct pronunciation of the word " Niagara."

1826

(The) northern traveller: containing the routes to Niagara, Quebec, and the Springs, with the tour of New England, and the route to the coal mines of Pennsylvania. 2d ed. imp. & ext. N. Y.: A. T. Goodrich. 1826. Pp. 80–95. 1826

A guide to points of interest, scenic and historical. A view of Niagara from below, engraved by Peter Maverick, one of the best of the early engravers. The view in question is of the Horseshoe Fall at Table Rock and very much emphasizes the distance behind the sheet of falling water.

In the edition of 1834 the account of the Falls is found on pages 69–70. On page 70 is the following description of the " Sorcerer's Cave."

A very singular cavern was discovered, in 1825, about a mile below the falls, which is reached by descending the old Indian

1826 ladder, a steep path-way, rendered passable by roots, rocks, etc. The cave is about 80 yards below the ladder. The way to it is difficult; the passage is barely large enough to admit a man, and in it are found stalactites, and specimens of something that seems like petrified moss or wood. About 20 feet above is a beautiful spring, issuing from a rock, in a singular rocky position; and there is another cave near by which is also worthy of a visit.

1827

1827 A trip to Niagara. By a Washingtonian. (Soc. lit. miss., Nov. 1827. 3:657–664.)

An account of the journey to the Falls, with a description of the cataract and the effect of the spectacle upon the feelings of the beholder.

1828

1828 Stuart STUART, JAMES. Three years in North America. 3d ed. rev. Edin.: Robert Cadell. Lond.: Whittaker and Co. 1833. Vol. I. Pp. 138, 140–141.

From Black-Rock we had a very pleasant ride, by a level road along the river side sixteen miles, to Chippewa, the battle-ground of a severely contested action between the Americans and the British in 1814, and to Niagara Falls, three miles farther. The country we passed through was entirely level, greatly over-cropped, and there was very little appearance of industry or exertion to reclaim it. Wherever the stage stopped to water the horses, the doors were crowded with children offering apples and plums for sale; and we saw, for the first time on this side of the Atlantic, several beggars.

We distinctly heard the sound of the cataract, about ten miles from the falls; but it is often heard at a far greater distance in favourable states of the wind and atmosphere, even, it is said, thirty miles from them. The spray, appearing like a cloud of smoke, was visible at the distance of more than two miles.

. . . . .

The best points of view are from the Table Rock and from the boat, from which the falls, as well on the American as on the

Canada side, are seen. But the rapids are seen to the greatest advantage from Goat Island, to which a very ingeniously constructed and strong rough bridge has been thrown on the American side, over great blocks of rock and rapids. 1828 Stuart

There is no difficulty in getting to these stations. To Table Rock, the way across the field from the hotel is without any difficulty; and there is a winding path to facilitate the descent of about 300 feet to the boat. The water is a good deal agitated at the point, about 1,200 yards in width, where the boat crosses, but the boatman's knowledge of the eddies enables him to pass with perfect safety in ten or fifteen minutes. Passengers must, however, lay their account with something like a drenching from the spray of the falls in crossing, and should be well provided with great coats. There is a steep wooden stair from the landing-place, to the top of the bank on the American side. . . .

1829

STONE, WILLIAM LEETE. From New York to Niagara. Journal of a tour, in part by the Erie canal, in the year 1829. (Pub. Buff. hist. soc. 1910. 14:238–241.) 1829 Stone

We left Lockport in a mail coach at half past 1. Our travelling companions hence to Lewiston, were a boisterous gang of Universal Suffrage Jackson men, on their way to attend the exhibition got up by the hotel-keepers at the Falls, to collect a crowd of customers in a dull season. Our road was across to the "Ridge Road," which we did not reach until within two miles of Lewiston, was over a new country, some of the way almost entirely unsettled. The land was higher than for the last hundred miles, and the soil apparently somewhat inferior. But the forests were yet more lofty and imposing. Oaks and occasionally sycamores of immense size, now mingled with the towering maples and elms. We passed through a section of the Indian reserved lands, partially settled by a portion of the Tuscarora tribe of Indians. These improved lands, with a very few exceptions, appeared in a sad state of neglected cultivation. For several miles, while traversing the northern verge of this mountain ridge,

1829 Stone

our admiration was engrossed by the prospect of one of the most glorious uncultivated landscapes upon which the eye of man ever reposed. Beneath our feet on the north, and extending from east to west as far as the eye could reach, was stretched a belt of woodland, apparently perfectly level, from the base of the mountain to the southern shore of the lake. Although the whole of this tract of land is sparsely settled, yet the forest so far predominates over the occasional spots of cultivation, that the latter were entirely merged in, and lost in the former. To the eye, the tops of the trees presented the even surface of a parlour floor; and the forests having changed the verdant foliage to those numberless bright and beautiful hues which are the peculiar mark of our American autumn, rendered the whole surface far more beautiful than the most gorgeous carpet ever imported. All the colors and hues which Nature can paint, were here blended together in the sweetest harmony; and had the whole extent been covered by a grand collection of all the blossoms that ever bloomed since the gates of Paradise were closed, glowing in their richest and brightest tints, they could not have constituted a richer flower garden. But ". . . expression cannot paint the breath of Nature and her endless bloom!"

Beyond this, the most delightful region that "fancy's footsteps ever trod," rolled the dark waters of Ontario, bounded on the north by the azure hills of Upper Canada, which rose dimly in the distant horizon! Soon after we descended upon this lovely plain, we came in sight of Lewiston beyond which the monument which Canadian patriotism has erected to the memory of Gen. Brock, upon Queenston Heights, rose loftily in view. Lewiston is a very pleasantly situated and pretty town. We did not stop at the spacious and inviting hotel, but as the sun was yet shining brightly upon us, we rode directly down to the ferry. And here, for the first time did I behold the troubled waters of the Niagara — the mighty river, the name of which of all others was the most deeply implanted in my memory in my school boy days! the grand outlet of the great inland seas of the still greater

West! The banks on either side above and on either hand, on the American shore, were high, rocky and precipitous; and the river itself is confined by its massive barriers, to a narrower space than I had supposed. The current is rapid, and it boils and whirls, and in some places breaks into a surf, as though not yet restored to tranquility after its angry leap over the great cataract seven miles above. None but a small row-boat was plying upon the ferry, in which we should, as strangers, scarcely have ventured, had we not seen it safely rowed across the river by a single hand, for our accommodation. We passed over the dark and troubled current, however, speedily, and in safety; and for the first time I found myself in a foreign country, and under the power of one who " a kingly crown has on." I am as decidedly a *Republican* in *principle*, as any man. But I am no Jacobin — no democrat. I hate the mob: and I have such an utter loathing of the character of Jackson — such a thorough and hearty detestation of his scurvy administration, that it was a relief to me to get beyond his jurisdiction. I seemed to breathe a purer air; and although I love my own country best, and its institutions, yet I regretted that my circumstances were such as to compel me to return within the United States, until the people shall have returned to their senses, and this disgraceful state of things terminated. At the tavern, near the ferry, I was detained nearly an hour, for the want of a carriage, to take us over to the falls. . . . 1829 Stone

The village of Queenston stands at the foot of the heights, and is not a town of much consequence, though rendered memorable during the last war with England, by the brilliant, though in the end unfortunate, expedition of Gen. Van Rensselaer, in 1812. I gazed for some time upon the heights, and upon the steep ascent up which the gallant Solomon Van Rensselaer led his troops, cutting his way through a line of British troops, with his sabre, as he fell covered with wounds. I gazed also, but with feelings of mingled shame and indignation upon the opposite shore, where our own recreant militia stood, refusing to pass

1829 Stone over and secure the victory which Van Rensselaer and the brave Col. Fenwick had won — refusing to cross even to save their brethren, who had gallantly carried the heights. . . .

1830

1830 The fashionable tour: a guide to travellers visiting the middle and northern states and the provinces of Canada. 4th ed. enl. and imp. Saratoga Springs: G. M. Davison *and* N. Y.: G. and C. and H. Carvill. 1830. Pp. 262, 268–275.

Full information is given as to stage routes. There is a matter-of-fact description of the Falls, on both the Canadian and American sides. We also learn that at that period, "On Bath Island" mills had been erected, "contiguous to what is termed the *race-way* which divides Bath from Goat Island. The latter, which is 330 yards broad, is principally a wilderness."

1830 Ferrall FERRALL, S. A. A ramble of six thousand miles through the United States of America. Lond.: Effingham Wilson. 1832. Pp. 28–35.

Beside the description of the walk from Tonawanta to the Falls there is an account of the Falls themselves, which is not very satisfactory. Considerable space is given to the queer characters seen in the hotel.

The distance from Tonawanta to the village of the Falls, now called Manchester, is about eleven miles. The way lies through a forest, in which there are but a few scattered habitations. A great part of the road runs close to the river Niagara; and the occasional glimpses of this broad sheet of water, which are obtained through the rich foliage of the forest, added to the refreshing breeze that approached us through the openings, rendered our pedestrian excursion extremely delightful.

1830 Fowler FOWLER, JOHN. Journal of a tour in the state of New York in the year 1830 . . . Lond.: Whittaker, Treacher and Arnot. 1831. Pp. 131–147.

From Buffalo, the approach may be made either on the American or Canadian side of the river. I preferred the latter, and getting into a stage about eight o'clock, was conveyed three miles to *Black Rock*, a small, but increasing village on the east bank of the river, and upon the line of the canal; like Buffalo

destroyed by the British in 1814. The river here is about a mile in width, running with a very moderate current, and twenty-five feet deep. Over this we were ferried in a boat, with paddles worked by horses. On the Canada side, just as you land, are a few houses, christened "Waterloo," very near the site of old Fort Erie, the scene of desperate engagements between the Americans and the British, during the last war, as was, in fact, nearly the whole extent of the river from lake to lake. 1830 Fowler

Continuing along the banks of the stream, we shortly came opposite *Grand Island*, which is twelve miles long, and from two to seven broad, and was ceded to the State of New York by the Seneca Indians in 1815. We were about twelve miles distant, when looking in the direction of the falls, I saw the spray, which I at first mistook for smoke, rising in columns to a very considerable height, and the whole horizon around skirted with light clouds; I also began to hear the sound of them very distinctly. Besides Grand Island, the river contains a number of other small islands, and independent of the influence of that excitement by which, at every progressive step, the mind and feelings become more deeply aroused, the ride itself, the whole distance, is one of singular beauty and interest. Until we reached Chippewa, the stream had been gliding along with a smoothness which left you wholly unprepared for the ruffled and tumultuous scene it was so soon to present.

. . . . .

The *Terrapin Rocks* are approached by a rudely constructed bridge from Goat Island. They extend about 300 feet from the shore to the Horse Shoe Fall, and, at their farthest verge, absolutely overhang the vast abyss into which the torrent rolls with all its thrilling and majestic grandeur.

. . . . .

I confess the impression was awful, but to me, if I may so say, it was *awfully enchanting;* my excitement was raised to a pitch which seemed to dispel the idea of danger, and I verily believe if, at that moment, I had known it to be imminent, I should have

1830 Fowler

retreated from the position with some hesitation and reluctance. I was dumb with high and enthralling amazement.

. . . . .

From the Table Rock I next passed under the fall. The descent is by means of a spiral stair-way which is inclosed, and on arriving at the bottom of which I had to doff every vestige of clothing, and was furnished by the guide, who was about to accompany me, with a waterproof garment in lieu of it: the necessity of this exchange I full soon discovered, being completely enveloped in a cloud of spray. The path is a very rugged one, under awfully overhanging rocks, and as we approached nearer and nearer, the roar, the tumult, and the agitation which encompassed us " around, above, below," was appallingly, grandly terrific. The violence and density of the spray, too, increased at every step, so that we were obliged to carry our heads down to respire at all; and in one part, where there is a considerable projection, it was driven against us with such almost incredible vehemence that it required no trifling effort to keep on our feet. I can compare it to nothing better than the most violent of thunder rain, which, instead of falling vertically, is propelled horizontally, with the fury of a tornado. The walking, too, is rendered more difficult by the number of small eels, which are twisting about under your feet in all directions. At length, however, staggering and stumbling on, we reached what is called *Termination Rock*, 153 feet from the commencement of the volume of water, and beyond which there is no proceeding, the descent being nearly perpendicular. Few, I believe, evince any inclination to explore thus far, though *tales are told* of persons taking a meal underneath, and so on; which, for the mere *say-so*, certainly *might* be done, as any one, if so disposed, might treat himself to dinner in a shower-bath, nor fear having to complain of a *dry morsel;* but be assured the inconvenience of such a ceremony under the Falls of Niagara would, if possible, be an hundred-fold greater. After remaining some time seated on the farthest projection of rock, contemplating the wildly majestic and

novel character of the scene around, I returned to the stair-way, and on reaching the little building which has been erected at the top of it, and casting off my drenched surtout, I was presented by my guide with a printed form of certificate, in testimony of the performance, in the following words: To wit,— "This may certify that Mr. John Fowler has passed with me behind the Great Falling Sheet, under the Falls of Niagara, to 'Termination Rock.' Given under my hand, at the office of the General Register of Visitors, at the Table Rock, this 30th day of August, 1830.— (Signed) W. D. Wright, G. N. F." 1830 Fowler

Continuing from this along the bank, about a quarter of a mile lower down, is a man in attendance with a small boat to ferry across the river. To a stranger it would appear altogether impossible for a boat to *live* in such a water, and certainly the impetuosity and strength of the current, together with its numerous eddies, are not quite pleasant; but I had every confidence in my ferryman, apparently grown gray in the service, and was right little disposed to indulge in any groundless apprehensions of danger. He even told me, but this *he* esteemed a *feat*, that his son, a boy of twelve years of age, had, more than once, swam across.

. . . . .

I ascended from this place [foot of the American Fall] by a long flight of stairs, which has been constructed to the top of the bank, and passing along the shore about a quarter of a mile, came to a bridge which has actually been carried across the rapids to Bath Island, and upon which, (will it be believed?) there is a large paper mill, as well as other mills, in operation; there is also a house where the weary traveller may find most comfortable refreshment, and where I partook of all the dinner — it was a very slight and hasty one, to be sure — I either had or needed during the day. My feasting was of another character, but the richest, the noblest, the most sumptuous banquet I ever did, I ever can enjoy.

. . . . .

1830 Fowler

From Bath Island I passed by another bridge on to Goat Island, which is perhaps about a mile in circumference, overgrown with trees and shrubs of different kinds . . . but here, in my opinion, is obtained decidedly the finest view of the rapids, and the principal fall, which is to be had from any situation around them. I allude, of course, to the *Terrapin Rocks*. . . . There is another very small island adjoining Goat Island, called *Iris Island*, from which a stair-way has been constructed to the foot of the falls, affording an excellent position for contemplating them from that part.

1831

1831

(The) tourist or pocket manual for travellers on the Hudson river, the western canal, and stage road, to Niagara Falls . . . 2d ed. enl. and imp. N. Y.: Ludwig and Tolefree. Pp. 59–61.

In edition of 1838, see pages 55–60.

1833

1833 Butler

BUTLER, FRANCES ANNE. Journal. 2 vols. Phila.: Carey, Lea and Blanchard. 1835. Vol. II, Pp. 215–218.

The visit of this author, better known to the world as Fanny Kemble, was made in July, 1833. She describes her journey to the Falls and the approach to them, but does not attempt any description of the cataract.

At nine o'clock we started from Lockport: . . . The road between Lockport and Lewistown is very pretty; and we got out and walked whenever the horses were changed. . . . We reached Lewistown at about noon, and anxious inquiries were instituted as to how our luggage was to be forwarded when on the other side; for we were *exclusive extras* — and for creatures so above common fellowship there is no accommodation in this levelling land. A ferry and a ferry-boat, however, it appeared there were,— and thither we made our way. . . . The ferry-boat being at length procured, we got into it. The day was sultry; the heat intolerable. The water of this said river Niagara is of a most peculiar colour, like a turquoise when it turns green. It was like a thick stream of verdigris, full of pale, milky streaks, swirls, eddies, and counter-currents and looked as if it was running

up by one bank, and down by the other. I sat in the sun, on the floor of the boat, revising my verses. 1833 Butler

. . . . .

Arrived on the other side, i. e. Canada, there was a second pause, as to how we were to get conveyed to the falls. My father, ——, and D, —— betook themselves to an inn by the road-side, which promised information and assistance; and —— and I clambering up the heights of Queenston, sat ourselves down under some bushes, whence we looked towards Lake Ontario, and where he told me the history of the place; how his countrymen had thumped my countrymen upon this spot, and how the English general Brock had fallen, near where we sate. A monument in the shape of a stone pillar had been erected to his memory, and to the top of this — betook himself to reconnoitre, which ambitious expedition I felt no inclination to share. After he had been gone some time, I thought I perceived signs of stirring down by the inn door; I toiled up the hill to the base of the pillar to fetch him, and we proceeded down to the rest of the party. An uneasy-looking, rickety cart, without springs, was the sole conveyance we could obtain, and into this we packed ourselves. —— brought me some beautiful roses which he had been stealing for me, and —— gave me a glass of milk, with which restoratives I comforted myself, and we set forth. As we squeaked and creaked (I mean our vehicle) up the hill, I thought either my father's or ——'s weight, quite enough to have broken the whole down, but it did not happen. My mind was eagerly dwelling on what we were going to see; that sight which —— said was the only one in the world which had not disappointed him. I felt absolutely nervous with expectation. The sound of the cataract is, they say, heard within fifteen miles when the wind sets favourably: to-day however there was no wind: the whole air was breathless with the heat of midsummer; and though we stopped our wagon once or twice to listen as we approached, all was profoundest silence. There was no motion in the leaves of the trees, not a cloud sailing in the sky, everything was as though in a bright warm death.

1833
Butler

When we were within about three miles of the falls, just before entering the village of Niagara,—— stopped the wagon, and then we heard distinctly, though far off, the voice of the mighty cataract. Looking over the woods which appeared to overhang the course of the river, we beheld one silver cloud rising slowly into the sky — the everlasting incense of the waters. A perfect frenzy of impatience seized upon me. I could have set off and run the whole way, and when at length the carriage stopped at the door of the Niagara House, waiting neither for my father, D——, nor ——, I rushed through the hall, and the garden, down the steep foot-path cut in the rocks. I heard steps behind me, — was following me; down, down I sprang, and along the narrow foot-path, divided only by a thicket from the tumultuous rapids, I saw through the boughs the white glimmer of that sea of foam — " Go on, go on, don't stop," shouted ——, and in another minute the thicket was passed. I stood upon Table Rock. —— seized me by the arm, and without speaking a word, dragged me to the edge of the rapids, to the brink of the abyss. I saw Niagara — Oh, God! who can describe that sight!!!

1833
Davison

DAVISON, G. M. Niagara Falls: the traveler's guide through the middle and northern states and the provinces of Canada. Saratoga Springs: 1833. Pp. 264–272.

1833
Shirreff

SHIRREFF, PATRICK. A tour through North America; together with a comprehensive view of the Canadas and United States as adapted for agricultural emigration. Edinb: 1835. Pp. 88–94.

This literary farmer gives us his general impressions of the river and Falls; the hotel on the American side; an account of his trip across the ferry to Canada, behind the sheet,— the air currents, eels, and toads; the beauty of the rapids; tells us the best side from which to take a first view of the Falls; describes the city building on the Canadian side, and tells of the agricultural state of the country around.

Immediately after dinner we set out for the Pavilion House, a celebrated hotel in Canada, a porter conveying our luggage in a barrow to the ferry, which we reached by descending a wooden spiral staircase. The river is 1,200 yards broad. The agitated

state of the waters conveys an idea of danger, and we were landed safely on the opposite beach in 14 minutes, having been drenched in crossing by the spray of the falls. Mr. D—— remained with the luggage, while we went in search of assistance to transport it. Two men of colour were met carrying trunks to the ferry, who brought ours on their return. 1833 Shirreff

1834

Report on the location and expense of a ship canal around Niagara Falls; also, from the Illinois river to Lake Michigan. With a report of a select committee to the assembly April 14, 1834, relating to the connection from Oswego to the Hudson. N. Y.: Office of the R. R. jour. 1834. Pp. 1–7. 1834

This report was collated from the report of N. S. Roberts, C. E., made in January, 1826, for an association of gentlemen residing in Manchester and Lewiston. It was published in pursuance of a resolution of the Chamber of Commerce of New York, September, 1834. A state convention was held at Utica September 11, 1834, to consider the project for a canal around the Falls. This movement was inspired by jealousy of Canadian canal development, and the projects of other states, and by the fear of the loss of the upper lake trade, and the inadequacy of the Erie canal as well as a desire for southern and western trade.

The following report, . . . is collated . . . with the view of ascertaining the location and expense of a Canal, of the dimensions stated in the accompanying estimate. It has been published at this latter day with a view to disseminate the only information as yet possessed on this subject. It serves the purpose, however of proving the practicability of the project, and guide by which to judge of the comparative expense of a construction on a larger scale.

This improvement, so decidedly *national* in its character, should be proportioned to the largest class of steamboats and schooners navigating the lakes, and correspond with the *Ship or Steamboat Canal* on the St. Lawrence, with locks 55 feet wide, 10 feet deep, and 200 feet long; by which vessels from the ocean can be passed to our upper lakes.

1834 It was this magnificent work, now in successful progress, under the patronage of the British government, to be finished by contract within two years, and the completion, by the State of Pennsylvania, of her communication with Pittsburg, on the Ohio, which induced the call of a State Convention at Utica, the 11th of September last, " to take into consideration the project of a Ship Canal around the Niagara Falls, and one from Oswego to the Hudson "— the proceedings of which are hereunto annexed.

1834 Steele's Niagara guide book: being a synopsis of Steele's book of Niagara Falls . . . Buffalo. Steele. 1840.

" Steele's Book of Niagara Falls, first published in 1834, and which was the first work of any extent or accuracy ever published on the subject of this great wonder of the world."

1834 Tanner TANNER, HENRY S. The American traveler or guide through the United States. Phila.: Author. 1834. Pp. 86–87.

The height of the Falls, places of interest in the vicinity, routes from Niagara. An engraving of the Falls as seen from the American ladder forms the frontispiece of the book. There is also a small view of the Falls from Table Rock.

Another edition in 1836.

1834 (The) western traveller's pocket directory and stranger's guide; exhibiting distances on the principal canal routes in the states of New York and Ohio, in the territory of Michigan, and in the province of Lower Canada, etc. Schenectady: S. S. Riggs, Ptr. 1834. Pp. 32–34.

Some figures on distances and dimensions are given. There is no attempt at description. There is a quotation from an English writer for the trip under the Falls. The points of interest are indicated in passing.

1835

1835 Parsons PARSONS, HORATIO A. A guide to travelers visiting the Falls of Niagara, containing much interesting and important information respecting the Falls and vicinity, accompanied by maps. 2d ed. greatly enl. Buffalo: Oliver G. Steele. 1835.

1835 Vanderwater [VANDERWATER, ROBERT J.] The tourist or pocket manual for travellers . . . N. Y.: Harper. 1835. Pp. 67–74.

WILLIAMS, W. G. Report of a survey around the Falls of Niagara with a view to the construction of a ship canal, made during the year 1835. (H. R. doc. 214, 24th Cong., 1st sess.) 1835 Williams

1836

PARSONS, HORATIO A. The book of Niagara Falls. 3d ed. carefully rev. and enl. and accompanied by maps. Buffalo: Oliver G. Steele. 1836. 1836 Parsons

Another edition in 1838.

1839

DE VEAUX, SAMUEL. The Falls of Niagara, or tourist's guide to this wonder of nature, including notices of the whirlpool, islands, etc., and a complete guide through the Canadas. Buffalo: William B. Hayden. 1839. 1839 De Veaux

1840

HAWLEY, JESSE. Memorial against ceding to the United States the right to construct the Niagara ship canal and in favor of retaining it as the property of the state. (N. Y. state sen. doc. 108. April 11, 1840.) 1840 Hawley

(The) New York state tourist. Descriptive of the Mohawk and Hudson rivers. N. Y.: Goodrich. 1840. Pp. 75–82. 1840

Steele's book of Niagara Falls. 7th ed. carefully rev. and imp. Buffalo: Oliver G. Steele. 1840. 1840

"The work was originally prepared by Mr. H. A. Parsons, who was for a long time resident at the Falls, and familiar with the whole scenery at all seasons of the year, as well as with all the interesting localities in the vicinity; who omitted no means of obtaining accurate information in relation to the various facts stated, and his work was the first on that subject, of any extent or accuracy ever published."

Other editions in 1846, 1847, 1848.

1841

BONNYCASTLE, *Sir* RICHARD H. The Canadas in 1841. Lond.: Henry Colburn. 1842. Vol. I. Pp. 215–216; 241–247. 1841 Bonnycastle

A short journey of seven miles from Newark, or, as it is now generally termed, Niagara, takes you, either by the steam-boat or coach, to Queenston. By the former you stem this beautiful and rapid stream, having the most delightful scenery on either

1841
Bonnycastle

shore, and come suddenly, near Queenston, under the shadow of the rocky barrier which there hems in the mighty river, with a wall of rock almost perpendicular, and severed, as if by an earthquake, into a dreadful chasm only five or six hundred feet in width, up which neither steam, sail, nor oar will ever navigate; for from Queenston to the Falls, seven miles more, the angry river rushes between these aged walls, in a succession of rapids, whirlpools, and rushings without affording even a continuous edge, whereon the human foot may tread, to behold these mysterious strugglings of the pent-up Father of Rivers.

If you go by stage to Queenston and the Falls, almost the whole line of journey, for fourteen miles, reminds you of dear England, being a succession of fine fields, farms, and orchards, interspersed with noble groves of chestnut, whose dark foliage adds sublimity to the swift and deep current that rolls, in ceaseless course, so frequently within your view, for the first seven miles of the journey.

. . . . .

I attempted to make a road from the Clifton Hotel towards the Whirlpool, but found so many conflicting interests, that I had not the success which a longer residence might have afforded me. At present the road is somewhat difficult to follow along the top of the high, rocky precipitous wall which hems in the stream; but an active adventurous person may achieve it, and well he is repaid. A succession of magnificent rapids, caverns, and precipices are presented to his view; and the road itself, as it exists, is not bad for the first distance, or about a mile down to the Devil's Cavern, which is a large excavation, or natural hole, in the face of the precipice, about one-third of the way down. Rattlesnakes' Den is another on the opposite side. This road is a military reservation, and should be opened. It has not to contend with the difficulties which avarice otherwise threw in the way of the military reserve at the Falls being made free to the public.

Sir John Colborne, and his predecessor Sir Peregrine Maitland, attempted to make the Falls available to all visitors with-

out expense. Sir Peregrine was resisted by an American, who kept the great hotel, and took possession of the public property; and finding he could pocket a dollar or so for each person passing down to the Table Rock, fought the government a long time with success; and, owing to the engineer officer having employed an unarmed working party of soldiers to level the obstacles this person had purposely made in the paths, a most lucrative and excellent case of grievance was got up, which fed the traitor Mackenzie for years, and, I believe, is scarcely yet ended. The juries of the district, however, did not agree with the American hotel-keeper and ultimately gave a verdict in favour of the government. 1841 Bonnycastle

Sir John Colborne, desirous to open the Falls to the travelling world, gave a license of occupation revocable at pleasure, to Messrs. Clarke and Street, merchants of some wealth residing at the Falls, with the express understanding that they were to offer no obstacles to the public, were to keep the staircases and roads in order, and to plant and beautify the banks. They had a great interest in the locality; and having, with others, planned the construction of a pleasure city, if I may use the term, at the Falls of Niagara, which should become the most fashionable place of British North America, and having commenced a railroad to bring the American travellers and produce from Buffalo, they began erecting baths, a museum, etc., on the military reserve, and contrary to the express articles of the agreement which had been made with them — probably because they were the parties who had most strenuously resisted the American hotel-keeper in his endeavours to make Niagara a closed raree show.

The lieutenant-governor immediately took active measures to put a stop to the proceedings of these worthy merchants, one of whom was a Scotchman, the other originally from the United States. With this view, he employed the officer of engineers in charge of the reserve, to require them to desist from enclosing and building and that officer warned by the fate of his predecessor, taking care not to employ the military in any shape, caused one small stone to be removed publicly from the walls. On this, the

1841 Bonnycastle

very persons who had obtained the license of occupation, with the full understanding that it was granted to them in order to prevent the possibility of such another attempt as that of the American inn-keeper, now turned, full of grievance against the government, brought two actions of trespass against the officer of engineers, and, *mirabile dictu!* although one of them had sat on the judgment seat when the jury punished the American for his covetousness, they, by their great influence in the neighborhood, were able to obtain a decided verdict, with damages of five hundred pounds against the crown; and either they, or their heirs, now remain in actual possession of land of which they had humbly begged the temporary occupancy?

The City of the Falls proved, as any sensible person might have anticipated, a thorough failure, and the public have still access to the Table Rock, and staircase, owing to Messrs. Clarke and Street being unable to eject the government from a space of one chain, or sixty feet in width, along the upper edge of the precipice.

Travellers may, therefore, without paying toll to the miller proceed as far as the mill, constructed by one of the parties on the rapids above, and may also go down the staircase for nothing; though such is the profit derived from this staircase, that the bar-room, through which you must pass to descend, pays these people, I am told, two hundred a year.

You must also pay for going under the sheet of water, which is fair enough, as you must have a guide and water-proof dress.

But enough of this, which would not have been mentioned, were it not that the travelling public from all parts of the world is interested in it; and if the local government will put the case in Chancery, as I intended to do, there is but little fear that the beautiful banks of the Falls will not long remain at the mercy of private speculators.

1841 De Veaux

De Veaux, Samuel. The travellers' own book, to Saratoga Springs, Niagara Falls and Canada, containing routes, distances; . . . Buffalo: Faxon and Read. 1841. Pp. 95–258.

Written in colloquial form. Sketches are made in a tour round the Falls and vicinity, put into the form of four jaunts. Description, history, anecdotes, advice to travellers, fishing, etc., Part III, "The Falls of Niagara, description of this wonder of nature, of the whirlpool, islands, a jaunt to Canada, Table Rock, Brock's monument, etc." 1841 De Veaux

Another edition in 1845.

DWIGHT, THEODORE, JR. The northern traveller; containing the routes to the springs, Niagara, Quebec, and the coal mines; . . . 6th ed. N. Y.: John P. Haven. 1841. Pp. 49–58. 1841 Dwight

A clear, concise description of the points of interest. Figures given are inaccurate. Brief account of the battles of the War of 1812 in the vicinity of the Falls.

In edition of 1830, see pages 80–104.

1842

Pictorial guide to the Falls of Niagara; a manual for visitors . . . Buffalo: Salisbury and Clapp. 1842. 1842

Throughout the book, which is divided into three parts, are directions for visitors to the Falls. The first part deals with the Niagara strait and the shores, the second describes the Falls and the remarkable scenes in the vicinity, and the third gives the history of the region and various anecdotes.

1843

HULETT, T. G. Every man his own guide to the Falls of Niagara, or, The whole story in a few words. By T. G. H., a resident at the Falls. 3d ed. . . . Buffalo: Faxon and Co. 1843. 1843 Hulett

Another edition in 1844.

On pages 110 to 124 is to be found Lyell on "The Recession of Niagara Falls" from his Lectures on Geology, and on pages 125–126 are the Hennepin and La Hontan descriptions of the Falls.

1844

HOLLEY, ORVILLE LUTHER. The picturesque tourist; being a guide through the northern and eastern states and Canada; . . . N. Y.: J. Disturnell. 1844. Pp. 174–176. 1844 Holley

The tourist is referred to Orr's Pictorial Guide to Niagara Falls, published in 1842, for detailed description. A brief account of points of

1844 Holley interest and a list of the principal hotels are given, supplemented by a poem from the pen of Willis Gaylord Clark, two views and a detailed map or chart of the Falls, islands, etc.

1845

1845 Peck's tourist's companion to Niagara Falls, Saratoga Springs, the Lakes, Canada, etc. . . . Buffalo: William B. *and* Charles E. Peck. 1845.

1846

1846 (The) American guide-book; being a hand-book for tourists and travellers through every part of the United States . . . Phila.: George S. Appleton. 1846. Pt. i. Pp. 145–156.

Itinerary to places of scenic and historical interest. Two charts and a view of the Falls from the Canadian side are included.

1846 Cousin George. Cousin George Sketches of Niagara Falls and river. Buffalo: William B. *and* Charles E. Peck. 1846.

A juvenile sketch which contains a description and guide to the Falls with maps and views.

1846 De Tivoli, J. De Tivoli A guide to the Falls of Niagara, with a splendid lithographic view by A. Vaudricourt from a daguerreotype of J. Langheim. N. Y.: Burgess, Stringer and Co. 1846.

1847

1847 Appleton's railroad and steamboat companion. N. Y.: D. Appleton and Co. Phila.: Geo. S. Appleton. 1847. Pp. 185–193.

1848

1848 Album of the Table Rock, Niagara Falls, and sketches of the Falls and scenery adjacent. Buffalo: Jewett, Thomas. 1848.

Visitors' inscriptions quoted from the registers.

1848 Barton, James L. Barton Address on the early reminiscences of western New York and the lake region of the country. Delivered before the Young men's association of Buffalo, February 16, 1848. Buffalo: Jewett, Thomas and Co. 1848. Pp. 15–18, 61–64.

Account of the portage road and portage business before the War of 1812.

(The) Niagara Falls guide. With full instructions to direct the traveller to all the points of interest at the Falls and vicinity . . . Buffalo: A. Burke. 1848. 1848

Another edition in 1849.

1849

(The) Canadian guide book . . . Montreal: Armour and Ramsay. 1849. Pp. 1–9. 1849

1850

Appleton's new and complete United States guide book for travellers. N. Y.: D. Appleton and Co. Phila.: Geo. S. Appleton. 1850. Pp. 209–217. 1850

New and revised edition 1854, pp. 209–217.

1851

Burke's descriptive guide; or, The visitor's companion to Niagara Falls: its strange and wonderful localities. By an old resident. Buffalo: Andrew Burke. 1851. 1851

Other editions issued in 1852, 1854, 1855, 1857, and 1858.

(The) Niagara Falls guide with full instructions to direct the traveller to all points of interest at the Falls and vicinity. . . . 5th ed. rev. Buffalo: James Faxon. 1851. 1851

1852

JOHNSON, F. H. Every man his own guide at Niagara Falls without the necessity of inquiry or possibility of mistake; including the sources of Niagara, and all places of interest, both on the American and Canada side. . . . Rochester: D. M. Dewey. (1852) Pp. 1–93. 1852 Johnson

Besides presenting many interesting facts regarding the Falls themselves, the author includes descriptions of the several routes from the Falls to other points.

Other editions in 1853, 1854, 1856.

JOHNSON, F. H. A guide for every visitor to Niagara Falls. Including the sources of Niagara, and all places of interest, both on the American and Canada side . . . Buffalo: Phinney and Co. (1852)

Other editions in 1853, 1856, 1865, 1868, and 1871.

1853

1853 Hackstaff's new guide book of Niagara Falls; . . . Niagara Falls, N. Y.: W. E. Tunis and Co. 1853.

Earlier editions were issued in 1850 and 1851 respectively.

1853 New York Legislature NEW YORK (STATE) LEGISLATURE. An act to incorporate the Niagara ship canal company. (Laws of 1853, chap. 595.)

This act which was passed July 21, 1853, is a general act of incorporation. It was amended by chapter 772 of the Laws of 1866.

1854

1854 Fowler FOWLER, REGINALD. Hither and thither; or, Sketches of travels on both sides of the Atlantic. Lond.: Daldy. 1854. Pp. 204–213.

We crossed the stream again to Manchester on our way to Buffalo. . . . The mode of conveyance to Buffalo was by railroad, a distance of about twenty-one miles. The line, is merely a slip of iron nailed along a stout wooden rail, and was in many places broken and uneven. It would be perfectly unable to bear the weight and friction of an English locomotive, but answers tolerably well, where neither speed nor weight of the carriages is great; at any rate it is an improvement on the heavy "stage," plunging at every yard into a mud hole. A slightly open fence alone separated it for a considerable distance from the high road; there was nothing else.

1854 (The) Ontario and St. Lawrence steamboat company. Hand-book for travellers to Niagara Falls, Montreal and Quebec, and through Lake Champlain to Saratoga Springs. Buffalo: Jewett Thomas and Co. Pp. 36–49.

Stereotyped views.

1855

1855 Springs, water-falls, sea-bathing resorts, and mountain scenery of the United States and Canada; . . . N. Y.: J. Disturnell. 1855. Pp. 106–113.

Poem of David Paul Brown, *Upon Being Asked to Describe Niagara.*; descriptions of the various points of interest and other guide-book matter.

Tunis's topographical and pictorial guide to Niagara; containing also a description of the route through Canada, and the great northern route, from Niagara Falls to Montreal, Boston, and Saratoga Springs. . . . Niagara Falls: W. E. Tunis. 1855. **1855**

Other editions published in 1856, 1857, 1869, 1870, 1873, and 1874.

1856

ENSIGN, BRIDGMAN AND FANNING. Guide to the western rivers and lakes with engravings and railroad routes. N. Y.: Ensign, Bridgman and Fanning. 1856. **1856** Ensign

Plenty of figures but not very complete information as to points of interest. The Cave of the Winds is located on the Canadian side. The account is accompanied by a view of the Horseshoe Falls from the Canadian side.

International topographical railroad guide between the Atlantic seaboard and the Missouri river. W. E. Tunis. Niagara Falls, N. Y.: M. Wallace. Chicago: 1856. Pp. 52–58. **1856**

Compact and accurate account of Niagara Falls and vicinity, with special attention to the Suspension Bridge two miles below the Falls.

1857

ALLEN, STEPHEN M. Address on the occasion of the opening of navigation to Niagara Falls, July 4, 1857. Niagara Falls, N. Y.: Pool and Sleeper. 1857. **1857** Allen

A history of the Niagara portage.

DISTURNELL, J. *comp.* (A trip through the lakes of North America.) N. Y.: Disturnell. 1857. Pp. 206–217. **1857** Disturnell

HUNTER, WILLIAM S. JR. Hunter's panoramic guide from Niagara Falls to Quebec. . . . Boston. J. P. Jewett and Co. 1857. Pp. 1–18. **1857** Hunter

Profusely illustrated. Another edition in 1860.

Tourist's guide to Niagara Falls, Lake Ontario, and St. Lawrence River. . . . N. Y.: Disturnell. 1857c. Pp. 1–26. **1857**

(A) trip through the lakes of North America. . . . N. Y.: J. Disturnell. 1857. Pp. 206–217. **1857**

1857 Complete guide to the Niagara river, its rapids, falls, islands, and romantic scenery, interspersed with quotations of prose and poetry relating to the Falls.

1859

1859 (The) Falls of Niagara: being a complete guide to the points of interest around and in the immediate neighborhood of the great cataract; with views taken from sketches by Washington Friend, esq. and from photographs. Lond.: T. Nelson and Sons. 1859.

The views are fine and beautifully colored. Another edition in 1860.

1859 (The) new world in 1859, being the United States and Canada, illustrated and described. . . . Lond.: (1859) Pp. 72–76.

" With these preliminary remarks (figures) we shall proceed to describe the most important objects of interest, addressing ourselves as if the reader were on a visit there." The description, which is illustrated, begins on the American side and makes the " rounds."

1859 Niagara; its falls and scenery. . . . N. Y.: Harthill. (1859c) Pp. 1–17.

1860

1860 Nelson NELSON, T. AND SONS. The Falls of Niagara; being a complete guide to all the points of interest around and in the immediate neighborhood of the great cataract; with views taken from sketches by Washington Friend and from photographs. Lond.: Nelson. 1860.

Gives colored views of the Falls.

1860 Roebling ROEBLING, JOHN A. Report on the condition of the Niagara railway suspension bridge, 1860. (Jour. Frank. inst. Dec. 1860. 70:361–372.)

This report was made after an absence of two years, and Mr. Roebling says "After a thorough examination of all parts of the work, I am unable to report any change."

1861

1861 Barlow BARLOW, PETER W. Concluding observations and deductions on the Niagara bridge. (Jour. Frank. inst. Mar. 1861. 71:160–165.)

BARLOW, PETER W. Observations on the Niagara bridge. (Jour. Frank. inst. Jan. 1861. 71:16–22.)

Deals with the deflection, strength and durability of the Roebling bridge.

BARLOW, PETER. Observations on the Niagara railway suspension bridge. (Jour. Frank. inst. Feb. 1861. 71:237–238.) **1861** Barlow

This article, taken from the London Builder No. 927, deals with the suggestion of two London suspension bridges as a result of Barlow's observations on the Niagara bridge.

BARLOW, PETER W. On the mechanism of bridges. (Jour. Frank. inst. Feb. 1861. 71:89–93.)

Deals with the construction and cure of the undulation of suspension bridges.

1863

JOHNSON, F. H. Guide to Niagara Falls and its scenery. . . . Phila.: Childs. 1863. **1863** Johnson

A descriptive guide to all points of interest on both the American and Canadian sides with some account of the geology and recession of the Falls by Sir Charles Lyell.

Other editions in 1864, 1867, and 1868.

NATIONAL SHIP-CANAL CONVENTION. Proceeding of the convention held at the city of Chicago, June 2 and 3, 1863. Chicago: Tribune Co. 1863. Pp. 111–114. **1863** National Ship-Canal Convention

Abstract from Captain W. G. Williams's report on a Niagara ship canal, made in 1835, showing the proposed routes.

1864

NEW YORK (STATE). Report of the committee on commerce and navigation on the bill for the incorporation of the Niagara ship canal company, transmitted to the legislature January 22, 1864. Albany: Comstock and Cassidy. 1864. (Sen. doc. 21. January 22, 1864.) **1864** New York

Discusses the national character, military characteristics, commercial importance, and history of the Niagara ship canal project, with the scale of navigation and cost of transportation.

Niagara Falls. A guide and souvenir with a new series of views from photographs taken on the spot. Buffalo: Sage Sons and Co. 1864. **1864**

Itinerary separated from explanatory and anecdotal matter.

(A) souvenir of Niagara Falls, with a series of views in oil colors, from photographs taken on the spot. Buffalo: Sage. 1864. **1864**

1864 Descriptions of the points of special interest, of the river, below and above, with an account of some of the legends connected with the Falls. There is also a guide in English and French.

1865

1865 Hayes HAYES, J. D. "The Niagara ship canal;" and "Reciprocity," papers written for the "Buffalo commercial advertiser," together with the speech of Hon. Israel T. Hatch, in the convention at Detroit, July 14, 1865. Buffalo: Matthews and Warren. 1865. Pp. 1–21.

These papers, which were published by the resolution of the board of trade, discuss the commercial, political, and military necessity of another ship canal around the Falls of Niagara. Arguments against the proposed improvement are also given.

1865 Woodman WOODMAN, CHARLES C. Argument in favor of a marine railway around the Falls of Niagara, addressed to the committee on military affairs of the senate of the United States. February, 1865.

Includes extracts from Memorial of the National Canal Convention, assembled at Chicago, June 1863, and a proposed act for the marine railway in question.

1866

1866 (The) Canadian handbook and tourist's guide, giving a description of Canadian lake and river scenery and places of historical interest with the best spots for fishing and shooting. Comp. by H. B. Small, ed. by J. Taylor. Montreal: Longmore and Co. 1866. Pp. 170–184.

Describes the view from Prospect Point before any improvements were made. Another edition in 1867.

1866 Cutting CUTTING, H. S. The Erie canal vs. the Niagara ship canal. Argument of Hon. H. S. Cutting before the assembly committee on commerce and navigation, March 6, 1866.

Arguments against the Niagara ship canal.

1866 Miles MILES, HIRAM. Address before the assembly committee on commerce. March 6, 1866.

Opposed to the Niagara ship canal as a dangerous experiment.

1866 Railway time tables and traveller's guide through central New York, Niagara Falls, Saratoga Springs, etc. Buffalo: Felton and Brother. 1866. Pp. 91–100.

Three views by J. W. Orr.

Traveler's guide, and illustrated description of central New York, Niagara Falls, Saratoga Springs, etc., together with railroad time tables. Buffalo: Felton and Brother. 1866. Pp. 43–52. **1866**

Besides a brief well-written account of the history of the Niagara frontier, there is a most interesting, not to say entertaining and half jocular account of all points of interest in order. It is written in an unusually good style. Advises escape from the hackmen and ample time for a leisurely survey. Of unusual literary merit for a guide book account. There are two views of the Falls, one from the American shore and one from Goat Island, neither of them very good.

Another edition in 1886.

Drive first to Table Rock; now but a ruin, with hardly a trace of its former glory. In July, 1818, it lost forty feet of its width and one hundred and sixty feet of its length. In 1828 three other pieces fell off. In 1829 another body broke away, and on the twenty-sixth day of June, 1850, a huge mass, two hundred feet long, sixty feet wide, and one hundred feet thick, was precipitated down the bank.

1867

HUNTER, WILLIAM S. Hunter and Chisholm's panoramic guide from Niagara Falls to Quebec. Montreal: Chisholm. 1867. Pp. 1–18. **1867** Hunter

The authors have endeavored to give a "panoramic or picture map of all the most celebrated and picturesque points along the noble river."

(SMALL, H. B. *comp.*) The Canadian handbook and tourist's guide. . . . Montreal: Longmore. 1867. Pp. 170–185. **1867** Small

1869

HUMPHREY, JAMES M. Speech in the house of representatives, January 14, 1869, on bill No. 1212, to provide for the construction of a ship-canal around the Falls of Niagara. **1869** Humphrey

Proposed to substitute another bill providing federal aid for the enlargement of the Erie and Oswego canals.

1870?

BARHAM, WILLIAM. Descriptions of Niagara; selected from various travellers: with original additions. Gravesend: n. d. Pp. 102–105; 157–159. **1870?** Barham

1870? Barham

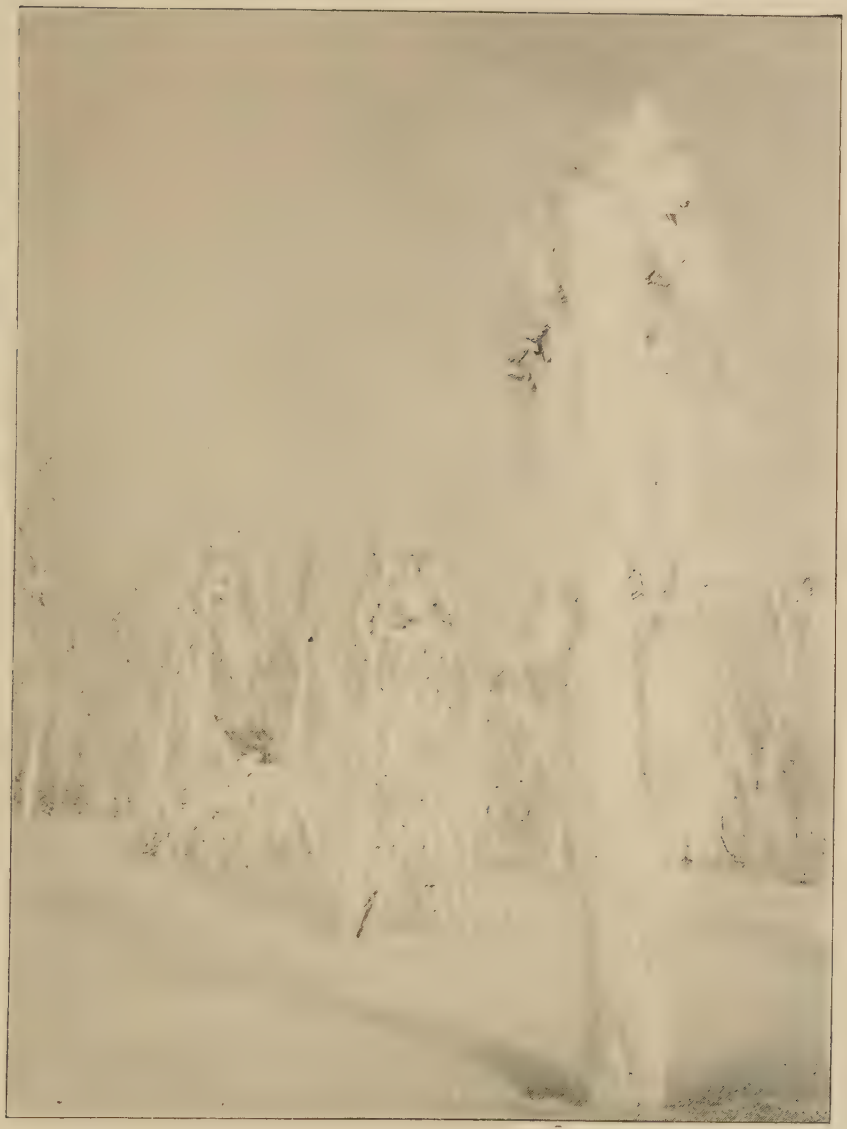
Pages 102–105 — Description of "Summer and Winter Scenery.— River below the Falls." One of the original additions apparently.

The surrounding scenery on both sides of the river is in good keeping with the magnificence of the Falls. It is just what it should be,— grand, striking, and unique. By most visitors it is only seen in summer. But in the winter it is also inimitable and indescribably beautiful. The trees and shrubbery on Goat and other islands, and on the banks of the river near the Falls, are covered with transparent sleet, presenting an appearance of "icy brilliants," or rather of millions of glittering chandeliers of all sizes and descriptions, and giving one a most vivid idea of fairy-land.

> "For every shrub and every blade of grass,
> And every pointed thorn, seems wrought in glass;
> The frighted birds the rattling branches shun,
> Which wave and glitter in the distant sun."

The scene presents a splendid counterpart to Goldsmith's description of the subterranean grottos of Paros and Antiparos. The mist from the Falls freezes upon the trees so gradually and to such thickness, that it often bears a most exact resemblance to alabaster; and this, set off by the dazzling colours of the rainbows that arch the river from twenty different points, seems by natural association to raise the imagination to that world, where the streets are of pure gold, the gates of pearl, and night is unknown.

> "Look, the massy trunks
> Are cased in the pure crystal; branch and twig
> Shine in the lucid covering; each light rod,
> Nodding and twinkling in the stirring breeze,
> Is studded with its trembling water-drops,
> Still streaming, as they move, with coloured light.
> But round the parent stem, the long, low boughs
> Bend in a glittering ring, or arbours hide
> The glassy floor. Oh! you might deem the spot
> The spacious cavern of some virgin mine,
> Deep in the womb of earth, where the gems grow!
> And diamonds put forth radiant rods, and bud
> With amethyst and topaz, and the place



A Winter Scene at Niagara

Showing the effect of the frozen spray on trees in the vicinity

Lit up most royally with the pure beam 1870?
That dwells in them; or, haply, the vast hall Barham
Of fairy palace, that outlasts the night
And fades not in the glory of the sun;
Where crystal columus send forth slender shafts,
And crossing arches, and fantastic aisles
Wind from the sight in brightness, and are lost
Among the crowded pillars."

The winter scenery about the Falls is peculiar, a sight of which is worth a journey of thousands of miles. Myriads of wild ducks and geese spend the day in and above the rapids, and regularly take their departure for Lake Ontario every night before dark; though some are often found in the morning with a broken leg or wing, and sometimes dead, in the river below the Falls. This generally happens after a very dark or foggy night; and it is supposed that, as they always have their heads up stream, while in the water, they are carried down insensibly by the rapids, till they find themselves going over the precipice, and then, in attempting to fly, they dive into the sheet of water, and are buried for a time under the Falls, or dashed upon the rocks.

Dead fish too, of almost all sizes and descriptions, and weighing from one to seventy pounds, are found floating in the eddies below the Falls, forming a dainty repast for gulls, loons, hawks, and eagles. The splendid gyrations of the gulls, and their fearless approaches, enveloped in clouds of mist, up to the boiling caldron directly under the Falls, attract much attention. But the eagle, fierce, daring, contemplative, and tyrannical, takes his stand upon the point of some projecting rock, or the dry limb of a gigantic tree, and watches with excited interest the movements of the whole feathered tribes below. Standing there in lordly pride and dignity, in an instant his eye kindles and his ardour rises as he sees the fish-hawk emerge from the deep, screaming with exultation at his success. He darts forth like lightning, and gives furious chase. The hawk, perceiving his danger, utters a scream of despair, and drops his fish; and the eagle instantly seizes the fish in air, and bears his ill-gotten booty to his lofty eyrie.

1870? Barham

Sometimes during a part of the winter, the ice is driven by the wind from Lake Erie, and poured over the Falls in such immense quantities as to fill and block up the river between the banks, for a mile or more, to the depth of from thirty to fifty feet, so that people cross the ice to Canada, on foot, for weeks together: the river itself is never frozen over, either above or below the Falls, but it affords an outlet for vast quantities of ice from the upper lakes.

. . . . .

Pages 157–159 — "The Village of Niagara Falls.— Number of visitors."

The country in the immediate vicinity of the Falls on both sides of the river presents many powerful attractions for a permanent residence. For salubrity of air and healthfulness of climate, it yields to no spot in the United States. Here,

> "Nature hath
> The very soul of music in her looks,
> The sunshine and the shade of poetry."

The latitude here is forty-three degrees six minutes north, and the longitude two degrees six minutes west from Washington. The winters are generally much milder than in New England, owing, as supposed, to the action of the two neighbouring lakes, that lie on either side.

In a pamphlet published in London in the year 1834, written by Robert Burford, Esq., who spent the summer and autumn of 1832, in taking a panoramic view of the Falls, it is stated that this place is "without all question, the most healthful of any on the continent of North America. The heat of summer can there be borne with pleasure, while at the same time, the annoyance of musquitoes and other insects is unknown. Various are the conjectures whence arises the remarkable salubrity of this region; but the most natural is, that the agitation of the surrounding air produced by the tremendous Falls, combines with the elevation and dryness of the soil, and absence of swamps, to produce this happy result."

In the summer of 1832, when the cholera raged in all the villages around, as Buffalo, Lockport, Lewiston, &c., not a single case occurred here. Again, when this disease visited many villages of the vicinity, in the summer of 1834, this place was wholly exempt. 1870? Barham

The village of Niagara Falls on the American side, formerly called Manchester, contains about 500 inhabitants.

There are two spacious hotels in the village, the Eagle and the Cataract, which will accommodate a large number of permanent guests. . . . The village also contains a Presbyterian Church, and a "Union House," for the use of all other denominations when they choose to come to it.— It has a Paper Mill, a Flouring Mill, and a few Mechanics' shops; and there is an opportunity of using water here to an unlimited extent.

Canal boats and sloops come from the Erie Canal and the Lake to Porter's store-house, a short distance above the Falls. There are three railroads now finished, which terminate at Niagara Falls. One from Buffalo, distant twenty-two miles — one from Lockport, and one from Lewiston. Stage-coaches run from the Falls in all directions, and the mail passes regularly twice every day. The roads from Buffalo, Lewiston, and Lockport are now very good; equal to any in this region, and afford to travellers many delightful views of the river, the Falls, and the rapids; — especially as the road from Buffalo to Lewiston passes very near the bank of the river the whole distance. The steamboat Red Jacket also runs daily from Buffalo to the landing, two miles above the Falls, and thence across to Chippewa, and returns daily by the same route. This is a perfectly safe and very pleasant route to the Falls. At Lewiston, seven miles below, steamboats from Lake Ontario are daily bringing and receiving passengers. Near Lewiston commences the celebrated Ridge Road,— formerly, without doubt, a sand-bank on the margin of Lake Ontario,— and runs east to Rochester, and thence nearly to Oswego, a distance of about 140 miles.

1870 National commercial convention, Detroit, Mich. Dec. 13, 1871. Proceedings of the National commercial convention to consider the question of increased transportation facilities from the West to the seaboard, held in Detroit, December 15 (i. e. 13), 1871. Published by order of the convention. Detroit: The Daily Post Book and Job Printing Establishment. 1872.

Advocated the building of a canal around the Falls of Niagara.

1872

1872 Alberger ALBERGER, F. A. Speech on the Niagara ship canal bill, before the house of assembly, March 20, 1872. Albany: Weed, Parsons and Co. 1872.

Believes the bill dangerous to the commercial interests and welfare of the state. Includes the report of the Canal Board on the Niagara ship canal.

1872 (The) Clifton suspension bridge at Niagara Falls. . . . Niagara Falls, N. Y.: Brundage. 1872.

1872 Hadfield HADFIELD, ROBERT. Memorial as to the proposed Niagara ship canal, the course of commerce on the lakes, etc. See, Statistics and information relative to the trade and commerce of Buffalo for the year ending December 31, 1871. . . . Reported by William Thurstone, Secretary. Buffalo: Warren, Johnson, and Co. 1872. Pp. 109–120.

Arguments against the proposed ship canal.

1873

1873 Faxon FAXON'S illustrated hand-book of travel by the Fitchburg, Rutland and Saratoga railway line, . . . Bost.: Faxon. 1873. Pp. 104–112.

Webster's description, written in 1825, is quoted at length.

1874

1874 Chapin CHAPIN, J. R. Niagara Falls and how to see them. Buffalo: (1874.)

1874 Horner HORNER'S Buffalo and Niagara Falls guide and encyclopedia of useful knowledge. Buffalo: Horner. 1874. Pp. 63–86.

1876

1876 How to see Niagara. . . . Buffalo and N. Y.: Matthews, Northrup and Co. 1876.

Profusely illustrated. Other editions in 1889 and 1890.

1877

New guide to Niagara, with descriptions of its scenery, casualties, narrow escapes, etc. Niagara Falls: Gazette printing establishment. 1877. 1877

1879

TUNIS' illustrated guide to Niagara. Rev. and pub. by H. T. Allen. Buffalo: Courier. 1879. 1879 Tunis

1880

People's guide to Buffalo, Niagara Falls and Chautauqua lake. Buffalo: 1880. Pp. 71–82. 1880

1881

ALLEN, H. T. Allen's illustrated guide to Niagara; rev. and pub. by H. T. Allen. Buffalo: 1881. 1881 Allen

Other editions issued in 1882 and 1883.

DELANO, F. R. The water power of Niagara. N. Y.: Banker's pub. assn. 1881. P. 4. 1881 Delano

In this connection it may not be inappropriate to mention a plan which was matured some years since for establishing a second Manchester in the County of Niagara. It was known as the Niagara ship canal project, and was the revival of a similar one which had been entertained some years before, and for which a survey had been made by authority of the War Department of the United States. Topographical Engineers under the charge of Capt. W. G. Williams. In 1853 Mr. G. W. Holley, then a member of the Legislature from Niagara, . . . presented a bill which was passed, authorizing the construction of a ship canal from some point on the river above the Falls into the river below them, or into Lake Ontario. The reports to the Canadian authorities of the operations of the Welland Canal for some years previous to that date showed that three-fourths of the business of that canal was done by Americans, and there was a strong desire manifested that a ship canal should be constructed on the American side of the river, which would be much shorter and more safely navigated that the long Welland Canal. The idea was so favorably received and supported by individual capitalists and

1881 Delano

by friends and officers of the Government, especially by Congressional representatives in the United States Congress from the Western and Northwestern states that a bill, with liberal provisions, authorizing the work was passed by a large majority of both branches of the Legislature of the State of New York. There was also a reasonable prospect that a donation of public land would be made in aid of the project. But the exciting political questions which engaged the attention of the people from 1854 to 1860 prevented further action on the question. Since it is supposed that Capt. Eades has started a new idea concerning the transportation of ships by rail across the Isthmus of Panama, it may be mentioned here that, in connection with the Niagara Ship Canal, it was proposed, if it should be constructed, to transfer ships of the largest size from the level of the Niagara river to that of Lake Ontario by rail, in floating docks or tanks. Another part of the plan was to furnish an inexhaustible water power to be used at the Lewiston ridge, below which a city of fountains was to be built. It is not impossible that the project may be consummated as a work of necessity for the following reason, if for no other, namely: that all the great water courses, east of the Mississippi, are gradually shrinking in capacity, so that in dry seasons like those of the last four years they cannot answer the demands made upon them.

1881

(The) Middle states: a handbook for travellers. . . . Bost.: Osgood. 1881. Pp. 177–184.

1881 Sweetser

SWEETSER, M. F. *ed.* The middle states; a handbook for travellers. . . . 4th ed. Bost.: Osgood. 1881. Pp. 177–186.

1882

1882 Holder

HOLDER, THOMAS. A complete record of Niagara Falls and vicinage, being descriptive, historical and industrial. . . . Niagara Falls: Published for the author. 1882.

Polite advertising schemes, illustrated.

1883

Buffalo Saengerfest guide and pocket companion; also guide to Niagara Falls. Buffalo: Hahn and Schelle. 1883. 1883

The complete illustrated guide to Niagara Falls and vicinity. Gazette printing house. Niagara Falls: (1883) 1883

Illustrations and map.

[Porter, Peter Augustus] The complete illustrated guide to Niagara Falls and vicinity. Niagara Falls.: Gazette printing office. 1883. 1883 Porter

Descriptive and scenic account of the Falls with some information regarding its history and geology.

1884

Cantilever bridge over Niagara. (Knowl., April 4, 1884. 5:227.) 1884

The description of the bridge is taken from the *Scientific American* and contains no reference to the Falls.

Kingsbury, J. Addison. Pleasure and travel made easy. A better way to see old sights or new . . . Vol. I. Pittsburgh: Kingsbury. 1884. 1884 Kingsbury

An expense book of the Allegheny Valley R. R.

Lespinasse, R. The great cataract illustrated, and complete guide to all points of interest at and in the vicinity of the Falls of Niagara. . . . Chicago: R. Lespinasse. 1884. 1884 Lespinasse

Quotations, pictures and general notes.

1885

Rhine, Alice Hyneman, *ed.* Niagara Park illustrated; original and selected descriptions, poems and adventures. . . . N. Y.: Niagara Pub. co. 1885c. 1885 Rhine

Points of interest, geography, history, geology, literature and legends.

Schneider, Charles C. The cantilever bridge at Niagara Falls and the discussion. (Trans. A. S. C. E. Nov. 1885. 14:499–606.) 1885 Schneider

This paper was read at the meeting of March 4, 1885, and is valuable technically with the discussion as embodying the views of expert engineers.

Tugby's illustrated guide to Niagara Falls. . . . Niagara Falls, N. Y.: Thomas Tugby. 1885. 1885 Tugby

1886

1886 Grand Trunk Railway

GRAND TRUNK RAILWAY. Excursion routes and rates from Buffalo and Niagara Falls via Grand trunk railway and Richelieu and Ontario navigation company's steamers. Buffalo: 1886. Pp. 1–3.

1886

Grand Trunk tourist's guide. Buffalo: Matthews, Northrup and co. (1886)

1887

1887 Severance

SEVERANCE, FRANK HAYWARD. Niagara in London: a brief study from many standpoints. Buffalo: 1887.

A very interesting study, embodying some of the material later published in more ample form in "Studies of the Niagara Frontier."

1887

Views of Niagara Falls and vicinity. 1887. [Photographs] no imprint.

1887 Welch

WELCH, JANE MEADE. The neighborhood of the international park. (Harp., Aug. 1887. 75:327–343.)

A charming account of Niagara river and Falls, from the point of view of the artist, the historian, and the man of science and with special reference to points of interest to the tourist.

1888

1888 Bogart

BOGART, JOHN. Feats of railway engineering. (Scrib. mag., July, 1888. 4:1–34.)

Includes accounts of the suspension and cantilever bridges at Niagara Falls with illustrations and drawings.

1888

Grand trunk railway system. (Summer resorts reached by the Grand trunk railway and its connections. . . . [Buffalo, 1888.] Pp. 47–51.)

1888

Michigan central railroad company. From city to surf. . . . "The Niagara Falls route." Chicago: Rand, McNally. 1888. Pp. 1–78.

1888

Niagara Falls illustrated. N. Y.: Albertype co. [1888]

1888

Niagara Falls sketch book. Buffalo: Sumner. 1888c.

Innumerable scratchy little sketches illustrating every phase of a visit and of the scenery. Interesting for inklings of conditions at the Falls at that period.

SEVERANCE, FRANK HAYWARD. How to see Niagara. Railway guide and illustrated handbook of Buffalo, Niagara Falls and vicinity. Matthews, Northup and Co. June, 1888. Pp. 35–37. **1888** Severance

Brief and clear.

1889

(The) great cataract of Niagara: its wonders, past and present. Buffalo: Matthews, Northrup and Co. 1889. **1889**

1890

DUNLAP, P. E. *comp.* Sheldon and Hawley's illustrated guide to Niagara Falls and points of interest. 1890. **1890** Dunlap

Fine photographic views of the Falls and suspension bridge from various points of view.

[GLUCK, J. F.] A little guide to Niagara Falls. . . . By an old resident. Buffalo and N. Y.: Matthews, Northrup and Co. 1890. **1890** Gluck

Advertisement of hotel keepers at the Falls, but well written with but little of an advertising nature and that unobtrusive. Mostly quotations from prominent visitors and writers. Takes up the beauty and grandeur of the Falls, their moral influence, the length of time which one should spend there, the climate, the best season for a visit, and the cost of the trip. There are many fine views.

Guide to Niagara Falls: historical, descriptive and short sketches from many authors. Buffalo: J. C. Prescott, excursion manager, Erie Railroad, n. d. **1890**

Composed largely of advertising matter.

JUDSON, WILLIAM PIERSON. From the west and north-west to the sea by the way of the Niagara ship canal. N. Y.: 1890. **1890** Judson

The military and commercial advantages of a Niagara ship canal, accompanied by the report of Captain Carl F. Palfrey, Corps of Engineers, U. S. A. On possible routes and cost of such a canal.

LEAGUE OF AMERICAN WHEELMEN. Eleventh annual meet, Niagara Falls, N. Y. August 25, 26, 27, 1890. Niagara Falls bicycle club. Pp. 17–24. **1890** League of American Wheelmen

Niagara Falls. [Buffalo and N. Y.: Matthews, Northrup, 1890.] **1890**

Description of the Falls with quotations and illustrations. Gives also

1890 the cost of a visit, with various details as to the best time for the trip, length of stay and so forth.

1891

1891 Newton [Newton, Samuel B.] Niagara and Chautauqua. Compliments of Western New York and Pennsylvania railroad. Buffalo: Wenborne-Sumner. (1891.)

A descriptive guide to the Falls containing numerous sketches and photographs interspersed with advertisements.

1892

1892 Long Long, Elias A. Niagara as it is. A complete guide. N. Y.: Rural pub. co. 1892.

A systematic guide providing for the most economical and advantageous use of the visitor's time. Tours are suggested, descriptions, general information, anecdotes, "impressions of visitors," with charts and views are given.

1892 Severance [Severance, Frank Hayward.] A new guide to Niagara Falls and vicinity. . . . Chicago and N. Y.: Rand, McNally. 1892. Pp. 1–124.

Gives an itinerary for the trip to the Falls, with descriptions of the scenery, history and other information.

1893

1893 Hopkins Hopkins, G. M. Atlas of the vicinities of the city of Niagara Falls, North Tonawanda and Buffalo, N. Y. Phila.: 1893 c.

Plates 3 and 5 show the Falls and islands.

1893 The Niagara book, a complete souvenir of Niagara Falls; containing sketches, stories and essays . . . by W. D. Howells, Mark Twain, Prof. Nathaniel S. Shaler, and others. Buffalo: Underhill and Nichols. 1893.

A book written to supply the lack of a "good souvenir" of Niagara Falls. It consists of "original stories, sketches, and essays — descriptive, humorous, historical and scientific — dealing directly with Niagara Falls." A new and revised edition in 1901.

Contents:

Part I. Almy, F. What to see. Dunlap, O. E. Dramatic incidents. Porter, P. A. Historic Niagara. Shaler, N. S. The geology of Niagara Falls. Day, D. F. The flora and fauna of Niagara Falls. Sellers, C. Utilization of Niagara's power. **1893** Hopkins

Part II. Twain, Mark. The first authentic mention of Niagara Falls. Howells, W. D. Niagara first and last. Martin, E. S. As it rushes by. Slicer, T. R. Famous visitors at Niagara Falls.

Part III. Buffalo and the Pan-American Exposition.

[Severance, Frank Hayward.] The Columbian year book. Niagara Falls and Buffalo, N. Y. Pub. by J. C. Prescott, excursion manager, Erie lines. Buffalo: 1893. **1893** Severance

Mostly advertising matter. Directions as to how to see Niagara, together with some statistics.

1894

New York central and Hudson river railroad company. What can I see? and how much will it cost me in two days at Niagara Falls? . . . N. Y.: N. Y. C. and H. R. R. R. Co. (1894.) **1894**

Itinerary and other information for visit to the Falls.

1895

Michigan central railroad. Niagara Falls from different points of view. Chicago: Knight Leonard and Co. 1895. **1895**

Quotations, information, colored views. Altogether a very pretty little booklet.

Niagara Falls park and river railway. Niagara River from the rapids above the falls to Lake Ontario. (Buffalo: Matthews, Northrup. 1895.) **1895**

1896

Dunlap, Orrin E. The new steel arch bridge over Niagara Falls. (Eng. news, Jan. 2, 1896. 35:13–14.) **1896** Dunlap

" One of the great engineering feats of the coming year."

Lutard, Auguste. Aux États-unis. Deuxième édition. Paris: Société d'éditions scientifiques. N. Y.: Brentano. 1896. Pp. 196–205. **1896** Lutard

The author tells us the purpose of his " guide " when he says:

" Je me contenterai donc de décrire le Niagara tel que je l'ai vu en 1894, c'est-à-dire depuis la création des nouveaux parcs, et depuis l'établissment du chemin de fer électrique . . . En un mot, je vais essayer

1896 Lutard d'être un Guide utile pour le voyageur français qui sera tenté de visiter cette merveille qui vaut, à elle seule, le voyage en Amérique."

1896 Michigan central railroad company. Niagara Falls in miniature. Chicago: Rand, McNally. 1896.

A very neat little booklet, well illustrated, consisting for the most part of quotations from famous visitors and literary lights,— Anthony Trollope, J. M. Heredia, Edwin Arnold, James A. Garfield, J. J. Audobon, William Black, Lady Duffus Hardy, Nathaniel Hawthorne, Bayard Taylor, etc.

1896 Morse MORSE, *Mrs.* S. D. Greater Niagara. Tourist's edition. Niagara Falls. 1896.

" Its parks, its drives, its railways, its hotels; All the beauties of this great watering place an dhow to see them." Points of interest, scenic and historical, are described.

1896 New York central railroad. Two days at Niagara Falls. Published by the passenger department of "America's greatest railroad." 1896.

1896 Paul Paul's dictionary of Buffalo, Niagara Falls, Tonawanda, and vicinity. Buffalo: Peter Paul Book Co. (1896.) Pp. 170–256.

" This complete guide " to " Niagara as it is " gives suggestions for tours, with accounts of the principal points of interest. Some impressions of travellers are given, and information concerning the geology of the district.

1896 Pen and sunlight sketches of scenery reached by the Grand trunk railway system and connections, with routes and rates for summer tours. 1896. Pp. 18–25.

Dickens's descriptions, together with information regarding access to the Falls and river.

1897

1897 Across Niagara's gorge. (Battle Creek, Mich.: W. C. Gage and Sons. 1897). (No title page, title taken from cover.)

A small guide to Niagara.

1897 Cutter CUTTER'S guide to Niagara Falls, and adjacent points of interest. Cutter's guide pub. co. 1897.

Takes up not merely the usual scenic and historical material, but has two very good articles on the power development at the Falls. All phases are very well illustrated.

Features of the Falls. (St. ry. rev., Oct. 1897. 7:644–646.) 1897

A description of the Falls and suggestions for visitors.

Grand trunk railway system. (Gateways of tourist travel. Pen and camera pictures of scenery reached by the Grand trunk railroad system and connections. N. d. 1897. Pp. 9–16.) 1897

1898

The new bridge at Niagara Falls as it looks now. (Illus. Am., Sept. 23, 1898. 24:233.) 1898

1899

The bridges of Niagara gorge. (Sci. Am., June 17, 1899. 80:296–297.) 1899

DUNLAP, ORRIN E. The romance of Niagara bridges. (Strand mag., Nov. 1899. 18:430–433.) 1899 Dunlap

No matter what caused the formation of the Niagara gorge, the fact remains that its existence has forced a wonderful demonstration of man's skill. The romance of the Niagara Bridges is the most marvellous and interesting story of its kind in the history of the world.

It is, indeed, a strange coincidence that as the current of the river cut its way through the canyon, it was separating what were to be sections of two nations — the river being the boundary between New York State and the Dominion of Canada — which were later to be brought into mutual rejoicing over the connection of the mighty cliffs by such a tender bond as that of a boy's kite-string.

In the early days, before the Niagara gorge had been spanned by a bridge, the only means of crossing was by a ferry operated close to the foot of the Falls — that great natural spectacle which has for centuries commanded the admiration of the people of the world. Then the Niagara locality was deemed quite a distance west, but ambitious man kept plunging still farther westward to open up the new country beyond. The gorge of Niagara lay across the direct pathway. It was evident that this obstacle to travel must be overcome, and the necessary money was secured to construct a bridge. The style of structure decided upon was of the suspension type, and the site was at the point where the edges

1899
Dunlap

of the cliffs were over 800 feet apart, and this right above where the terrible whirlpool rapids begin. . . .

The success met with by the promoters and builders of the railway suspension bridge created a demand for a bridge two miles farther up stream, close to the Falls, where the scenic feature was more pronounced. After much opposition a charter was obtained, and in the winter of 1867–68 a rope was carried across the river at the site of the proposed new bridge on an ice bridge, and thus connection was made between the cliffs at this point for another structure which was to develop many interesting incidents in bridge destruction and bridge construction. The bridge first built on this site was a wooden structure, opened to the public on January 2nd, 1869. It was only about 10 ft. wide, and carriages were unable to pass one another on it. This led to long waits at either end, and no doubt many readers of this article will remember the long lines of carriages moving in one direction across the bridge in caravan form, while many others were waiting for the line to pass in order that they might secure the right of way. Those were the days when the Niagara hackman was in his prime, and the locality had not been revolutionized by the electric trolley. In 1872 steel supplanted wood in the bottom chord, and in 1884 the wooden towers, in which elevators were operated on the Canadian side, gave way to towers of steel. In October, 1887, the work of widening the bridge was commenced, and it was completed June 13th, 1888, without any suspension of traffic. This gave an entire new steel structure from bank to bank, with a span of 1,268 ft. As a suspension bridge, it was the admiration of all who visited Niagara, but it was doomed to an untimely fate.

On the night of January 9-10th, 1889, the Niagara locality was visited by a terrific hurricane, and when daylight came in the morning not a single inch of the bridge proper remained, it having been torn away from the cliffs as though cut out by a knife, and the entire mass of steel lay bottom up in the gorge below. On the slopes of the bank on each side of the river the ends of the fallen mass were visible, while beneath the deep, silent waters of the

river the greater portion of the wreck was hidden, and there it remains to this day. . . . 1899 Dunlap

While they mourned the loss of their bridge the controlling companies were equal to the occasion, and at once ordered it to be duplicated. This rebuilding of the bridge was a feat of surprising rapidity; but as the iron-mills had all the patterns, the steel parts were quickly at hand. On March 22nd, 1889, the duplicate bridge was started, and on May 7th, 1889, it was opened for travel, thus accomplishing one of the most notable feats of bridge construction ever witnessed on the Niagara frontier. This structure had a width of 17½ feet, and when it was built the men behind it believed they were building for all time.

Not so, however. In 1889 they little realized that the ensuing decade would bring forth such wonderful changes in the Niagara region as to demand a voluntary destruction of the handsome structure they had built, in order that it might give way to a more modern and a better bridge. But all this was to be and has now taken place. With the development of great units of electrical power at Niagara Falls there was a revolutionizing force of wonderful power set free. The horse-car lines of the region and other new roads were electrically equipped, and a new force was set to work developing the Niagara surroundings. With the construction of electric roads on both sides of the gorge for scenic purposes there came a demand for international connection of the lines, in order that a belt-line trolley service might be operated about the gorge. The modern electric car is heavily weighted, and it was found that none of the bridges were sufficiently strong to furnish the required service. This led to the determination to replace the upper and new suspension bridge with an all-metal arch.

This arch was built in 1897–98, and has the distinction of being the greatest steel arch in the world. The abutments stand close to the water's edge on both sides of the river, and the length of the main span between them is about 840 ft. This arch has but one floor, on which room has been provided for double tracks

1899 Dunlap for the electric car service, the road being the first international line between the United States and Canada. There is ample room for carriages, and walks are also provided for pedestrians. As the bridge practically stands right in front of the Falls, a grand view of the cataract is obtainable. In the grace of its lines this arch is surpassingly beautiful, and is today classed as one of the wonderful things to be seen at Niagara. The method of erection was very similar to the arch first erected across the gorge, the suspension bridge being removed after the arch had been erected. It is the fourth bridge built on this site.

1899 Great gorge route. Niagara Falls and the Niagara gorge: being photographs by C. D. Arnold and G. E. Curtis; with text explanatory of the views. Niagara Falls. 1899.

1899 Keyes KEYES, MONROE JAMES. Tourists' illustrated guide book to the islands, peninsulas, and cities of Lake Erie and Niagara Falls. Bucyrus, O.: News pub. co. 1899. Pp. 78–79.

Facilities indicated for quick trip.

1900

1900 Passenger department of the Richelieu and Ontario navigation company. Official guide. 1900. From Niagara to the sea. . . . N. p. Pp. 5–9.

1900 Rebuilding Niagara's reservation bridges. (Sci. Am., Sept. 22, 1900. 83:187.)

An account of the construction of the concrete arch bridge between the mainland and Goat Island.

1900 Strengthening the cantilever bridge at Niagara. (Sci. Am., Oct. 20, 1900. 83:249–250.)

1901

1901 Almy ALMY, FREDERIC. What to see. (*In* The Niagara book. N. Y.: Doubleday, Page and co. 1901. Pp. 3–28.)

"A consecutive description for visitors" taking up the various points of interest, scenic and historical, on both sides of the river, mapping out a program for one day at Niagara, and giving various statistics of interest.

1901 Cutter CUTTER, CHARLES. Pan-American, Buffalo and Niagara Falls: a picturesque souvenir. 1901c.

Some fine photographs of the Falls from various points of view.

DUNLAP, ORRIN E. New concrete arch bridges at Niagara. (Sci. Am., Nov. 23, 1901. 85:327.) **1901 Dunlap**

An article on the bridges which connect Goat Island with the mainland.

Handbook to the Pan-American exposition, Buffalo and Niagara Falls. Chicago: Rand, McNally. (1899-1901c). Pp. 182–237. **1901**

Michigan central railroad. General passenger department. Niagara Falls. Chicago: Rand, McNally. 1901. **1901**

A well-arranged guide — How to see Niagara. The cost of the trip is given with a description of the infinite variety of the scenery. There is some account of the geology of the Falls and quotations from both prose and poetry. The book is also illustrated.

JUDSON, WILLIAM PIERSON. History of the various projects, reports, discussions and estimates for reaching the great lakes from tide-water, 1768–1901. N.p. N.d. Pp. 10–12. (1901.) **1901 Judson**

A natural sequence of the many projects for canals of various sizes from the Hudson to Lake Ontario, was the consideration of a canal from Lake Ontario to Lake Erie, and projects for such a canal were made in connection with and closely following the ones already described.

The first action was taken in 1798 when a company was chartered by the State of New York to construct around Niagara Falls, a canal capable of passing boats of eighty tons; which canal was to be completed within ten years, but which was never begun. On the expiration of this term, the Legislature directed the Surveyor-General of the State of New York to explore a route for a canal from the Hudson to Lake Erie and under this direction James Geddes, C. E., made survey for a canal around Niagara Falls from Schlossers to Lewiston. The results of this survey were published under date of January 9, 1809, as a Senate resolution, in which it was stated that goods were taken from Lake Erie to Lake Ontario by a 28-mile portage for which the charge was $10 per ton for the Niagara transfer only.

In 1826 another and more accurate survey was made by private individuals, where the matter rested until 1835, when Captain William G. Williams, of the United States Topographical

1901
Judson

Engineers was detailed to make survey for a ship canal to connect Lake Erie and Lake Ontario. Surveys were then made of five different routes, the results of which are published in seven large sheets, with report and estimates showing a canal with 10 feet depth of water. These are published as Doc. 214, H. R. 24th Congress, 1st session, 1836. This matter was again published as H. R. No. 201, 24th Congress, 2nd session, 1837, and also again published as part of H. R. Rep. 1430, 51st Congress, 1st session, 1890.

No further action was taken until 1853 when surveys, maps and estimates for a canal with 14 feet depth of water were made under New York State Commission by Charles B. Stuart, C. E., and Edward W. Serrell, C. E.

In 1863 President Lincoln appointed Charles B. Stuart, C. E., to make report and estimates for a gunboat canal of 12 feet depth and this report was published as H. R. Doc. No. 51, 38th Congress, 1st session, 1864. No action was taken until 1867, when surveys were made for the United States during that year by James S. Lawrence and Stephen S. Gooding, C. E. Six different lines were surveyed; three from Lewiston on the Niagara River, and three from Lake Ontaio; all being for a depth of 14 feet. These were published, with maps and profiles in report of the Chief of Engineers, U. S. A., pages 217 to 287, 1868, and again as part of H. R. Rep. 1430, 51st Congress, 1st session, 1890.

In 1889 a revision of former estimates and surveys was made by Captain Carl F. Palfrey, Corps of Engineers, U. S. A., for a 21-foot canal on two routes from Lake Ontario to Niagara river. These were published, with profiles and estimates, in the annual report of the Chief of Engineers, U. S. A., for 1889, at page 2434.

In 1889 a bill was introduced in Congress by Representative Sereno E. Payne as H. R. 582, 51st Congress, 1st session, under date of December 18th, providing for a Commission to select one of these routes and appropriating $1,000,000 for construction upon it. No action was taken by Congress.

In 1890 a report, with maps, profiles, and revised estimates was made by William Pierson Judson, M. Am. Soc. C. E., and was published as part of H. R. No. 283, 52nd Congress, 1st session, 1892, and as part of Senate resolution of the 54th Congress, 1st session, 1896, and was also published separately under title of "From the West and Northwest to the Sea by Way of the Niagara Ship Canal." These estimates were for two routes from Lake Ontario to Niagara River and for 21 feet depth of water. 1901 Judson

Reports were also made to Congress in 1890 by Representative Sereno E. Payne, and in 1892 by Representative C. A. Bentley, and in 1896 by Representative C. A. Chickering, and by Senator Calvin S. Brice, in each of which the commercial and engineering aspects of the case were fully presented and favorably discussed.

In 1895, under Senate resolution 130, which became a law on March 2, 1895, the President, in November, 1895, appointed a United States Deep Waterways Commission, consisting of James Angell, John E. Russell and Lyman E. Cooley, M. Am. Soc. C. E. The report made to the Commission by Mr. Cooley contains a large amount of valuable information on this subject and is accompanied by profiles of all the routes, giving information not before published. The report of the Commission was published under date of 1897 as H. R. Doc. 192, 54th Congress, 2nd session.

In 1898 the United States Board of Engineers on Deep Waterways elsewhere referred to, caused Charles L. Harrison, M. Am. Soc. C. E., to make surveys and estimates for canals 21 feet and 30 feet deep, connecting the waters of Lake Ontario and Lake Erie; the results of which surveys form a part of the report of this Board which was submitted to Congress on December 1, 1900.

In 1900 the State Engineer of New York, Edward A. Bond, M. Am. Soc. C. E., caused estimates to be made for canals around Niagara Falls as a part of the barge canal project on the basis of 11 feet depth in the locks, and 12 feet depth in the waterways as given in the report of 1901.

1901 Porter

PORTER, PETER A. Official guide. Niagara Falls, river, frontier; scenic, electric, historic, geologic, hydraulic. With illustrations by Charles D. Arnold. (Buffalo: The Matthews-Northrup Works. 1901.)

A complete guide, covering every aspect of the subject. Accurate, interesting, well written, and with fine views.

1901 Rand-McNally

RAND-MCNALLY. Hand-book to the Pan-American exposition, Buffalo and Niagara Falls . . . Chicago and N. Y.: Rand, McNally. (1901). Pp. 182–237.

Tells the traveler how to get to the Falls, the expense of the trip, and suggests tours in the vicinity. Gives also something of the history of the Falls and a description of the scenery.

1901 Reid

REID, ROBERT A. One hundred views of the Pan-American exposition, Buffalo, and Niagara Falls . . . Buffalo. 1901.

1902

1902 Bishop

BISHOP, IRVING. The red book of Niagara. A comprehensive guide to the scientific, historical and scenic aspects of Niagara. For the use of travellers . . . Buffalo: 1902.

An interesting and well-written guide describing the city of Niagara Falls, telling in detail how to see the Falls to best advantage, enabling the visitor, " whether his tastes be for the scenic, the scientific or the historical, to see Niagara from his own point of view, with the minimum outlay of time and money." The book gives a clear and concise account of the history, geology, power developments and industries at the Falls. It closes with a brief account of the fishing and hunting on the river, and differs from most guides in including a short list of references on the subjects treated.

In 1861, Joel Robinson, with an engineer and assistant, piloted the Maid of the Mist, one of the earlier steamers of that name, through the rapids to Lewiston. The trip was accomplished in safety, although the boat suffered some injury. On August 28, 1887, C. A. Perry of Suspension Bridge, N. Y., made the passage of the Rapids to the Whirlpool in a life-boat of special construction which he had himself made. R. W. Flack, of Syracuse, attempted the same feat in July following, but was drowned. A successful passage was made July 12, 1900, by Capt. Nissen of Chicago. His boat, "The Fool Killer," had a length of 24 feet with a 4-foot beam and was provided with six air compart-

ments. His idea of the boat seems to have been a misnomer. Several people have also safely passed through the rapids in strong casks built specially for the purpose. 1902 Bishop

In July, 1883, Captain Matthew Webb, who had previously swum across the English channel, lost his life while attempting to swim the Rapids. His body was recovered a few days later at Lewiston. A Bostonian named Kendall, in 1886, managed by the aid of a life preserver, to get though alive, though much exhausted.

. . . . .

Blondin came to Niagara in 1859 with his business manager, Harry Calcourt. He gave his first performances on a wire cable which was stretched across the Gorge from White's Pleasure Ground, about where the car-sheds of the Gorge Road now stand. At a subsequent exhibition, the cable was stretched across the Whirlpool Rapids, just north of the present Lower Arch Bridge. Among some of his feats were walking across the rope, chained hand and foot; making the passage in the evening; crossing with his feet encased in butter tubs; crossing without a balancing pole; carrying a cooking stove to the middle of the rope, where he stopped and cooked an omelette; turning handsprings, standing on his head, or sitting down sideways on the rope two hundred feet above the water, and many other equally daring acts. His greatest exploit was performed in 1860, when he carried Calcourt across the Whirlpool Rapids on his back, in the presence of the Prince of Wales. Four times in the course of the trip Blondin stopped to rest, each time setting his burden down upon the rope and resuming it to continue his journey.

Since Blondin's day other rope-walkers have imitated his feats with more or less success. In 1873 Bellini crossed on a rope stretched from Prospect Park to the opposite side near the Ferry Road. Stephen successfully crossed on a wire rope above the old Suspension Bridge, in 1878, and also jumped from the wire to the water. Samuel Dixon also crossed on the same wire. Madame Spellerini and others have made the passage safely at

1902
Bishop

various times, but no one achieved the reputation attained by Blondin.

On October 24, 1901, Mrs. Annie Edson Taylor passed over the Horseshoe Fall in a barrel and survived — a feat never before accomplished by anyone. The barrel in which Mrs. Taylor made the trip was strongly built of oak and weighted at the lower end with an anvil weighing 100 pounds. An opening at the top large enough to admit the body was closed by a valve. The barrel containing Mrs. Taylor was towed by two men in a row-boat over to the Canadian channel and released. It passed over the Horseshoe Fall about 200 feet from Table Rock, and was recovered in an eddy near the Maid of the Mist landing on the Canadian side. Except for a cut upon the head and a few bruises Mrs. Taylor was uninjured.

. . . . .

The principal fish caught with the hook in the Niagara River are yellow perch, yellow pike (the pike perch), blue pike, white, rock and black bass, and muskallonge. The best perch fishing begins about the middle of May and lasts until July. The fall run begins early in August and may continue till the middle of October, although the earlier part of the period is considered the best. Blue pike bite voraciously for a few days early in May, and are likely to be caught afterwards in fishing for perch. Yellow pike are readily caught either with bait or by " chuggin," from August 1 to September 15, although they may be taken in small numbers after May 1, especially with minnows. Black bass may be taken between June 16 and December 31. White bass may be taken in May on the American side of the river, but are protected on the Canadian side until later. Muskallonge are sparingly caught in Buffalo harbor and around Grand Island about June 1, and in the latter region in August and September. Sturgeon are speared in the river below the Whirlpool in May. Eels are caught in great numbers below the Falls, where they sometimes crawl out among the wet stones in their endeavor to pass up the river.

The best places for fishing in the lower river are at Lewiston or Queenston and at Youngstown. . . . 1902 Bishop

Above the Falls perch and rock bass fishing may be had at Schlosser's dock and at La Salle. . . . The fish do not run as large here as at Lewiston, but the fisherman is reasonably sure of a fair catch in the proper season. At Buffalo there is much fishing at the Ferry Street dock but the fish are small and few. Yellow pike and blue pike are caught during August in the early evening on the breakwater above Ferry Street. . . .

Duck hunting is good along the river in many places. Favorite spots for this sport are the upper reach of the Niagara where it leaves Lake Erie, in the vicinity of Grand Island, and between Grand Island and the head of the rapids. In the autumn of 1900 ducks were quite numerous between the Upper Arch Bridge and the Falls. During the winter they frequent the open water above the rapids, where they are shot in large numbers.

Michigan central railroad company. Niagara Falls. Chicago. 1902. 1902

1903

American library association, twenty-fifth annual conference. Niagara Falls, June 22–27, 1903. Buffalo: Matthews, Northrup and Co. 1903. 1903

A handsome booklet, well written and illustrated. Contains a history of the Falls and reservation together with an account of power development on the river.

1904

American institute of homeopathy. Sixtieth annual conference. Niagara Falls. June 20–25, 1904. 1904

Deals with the scenic, historical and industrial aspects.

BURK'S guide of Niagara Falls: directions as suggested by a resident. Niagara Falls: C. E. Burk. 1904. 1904 Burk

1906

SEVERANCE, FRANK HAYWARD. The story of Joncaire, his life and times on the Niagara. Buffalo. 1906. Passim. 1906 Severance

The following chapters are portions of an extended study,[1] as yet unpublished, of the operations of the French on the Lower

[1] Published in 1917 under the title An Old Frontier of France," 2 vol.

1906
Severance

Lakes, with special reference to the history of the Niagara region. The sources from which the narrative is drawn are almost wholly documentary, both printed and in manuscript. The most important printed sources are the "London Documents," and "Paris Documents," which constitute volumes five and nine of the "Documents relative to the Colonial History of the State of New York." . . . Some examination of the manuscripts themselves has been made in various depositaries, especially the Public Record Office and the British Museum in London, the Canadian Archives Office at Ottawa, and in the manuscripts office of the New York State Library, at Albany. Some facts have been gleaned from the Provincial Records of Pennsylvania. . . . With the exception of the short but precious "Histoire du Canada" of the Abbé de Belmont; the "Histoire de l'Amerique septentrionale" of De Bacqueville de la Potherie (Paris 1722); the works of Charlevoix and one or two other chroniclers who were contemporary with the events of which they wrote, the following narrative is based entirely on the documents themselves.

In June, Alphonse de Tonty left Montreal for Detroit, at which post he had been granted the privilege of trade, on condition that he would confine his operations to the jurisdiction of Detroit, nor send goods for sale to distant tribes. In crossing Lake Ontario, on his way to Niagara, he met nine canoes, all going to Albany to trade. Three were from Mackinac, three from Detroit and three from Saginaw. Tonty endeavored to head off this prospective trade for the English and succeeded so well, heightening his arguments by substantial presents, that they all agreed not to go to Albany, but to go with him to Detroit.

Two days later, when this imposing flotilla was within six miles of Niagara, they fell in with seventeen canoes, full of Indians and peltries. In reply to his inquiries, these also admitted that they were going to Albany to trade, though they added that they were coming to Detroit afterwards. Tonty was equal to the emergency. Inspired by self-interest as well as loyalty to his government, "he induced them also to abandon their design, by the

promise that the price of merchandise at Detroit should be diminished, and he would also give them some brandy." There followed a judicious distribution of this potent commodity. 1906 Severance

One is tempted to conjure up the scene. Here were twenty-six laden canoes, not counting Tonty's own boats. They had come long journeys from remote and widely separated points, and their one objective point was the Englishman's trading place on the Hudson. But no sooner do they come under the blandishments of the Frenchman, and scent the aroma of his brandy-kegs, than these long-cherished plans so arduously followed, are thrown to the winds. They beach their canoes at or near the point of Niagara. A cask of liquor is broached, and Tonty permits the thirsty savages " to buy two or three quarts of brandy each, to take to their villages. But they first agreed that it should be carefully distributed by a trusty person."

In spite of these reassuring precautions, the transaction seems somewhat to have burdened his mind, for he thought it well to explain that " he hoped the council would not disapprove of what he had done, nor of the continuance of the same course, as he had no other intention than merely to hinder the savages from going to the English."

He succeeded fairly well in that purpose. After the distribution of brandy, they all reembarked, seven of the canoes promising to go to Montreal. Tonty sent back with them his trusty interpreter, L'Oranger, to keep them from changing their minds as they paddled down the lake. " He was only able to conduct six of them to Montreal; the seventh escaped and went to Orange."

Meanwhile ten canoes joined the commandant's own retinue; all paddled swiftly up the Niagara to the old landing, made the toilsome portage around the falls and pushed on together for Detroit, where they arrived July 3d. It was a typical move in the game that was being played, and France had gained the point.

This expedition was notable for its use of the Niagara route. Only a few years before we find Vaudreuil explaining to the

1906
Severance

Minister that he dispatched the Sieur de Lignery to Mackinac, and Louvigny to Detroit, by the Ottawa-river route, because the Senecas had warned him that a band of Foxes lay in wait for plunder at the Niagara portage, or on Lake Erie.[1] If this were not duplicity on the part of the Senecas, it shows that war parties from the West foraged as far east as the Niagara; notwithstanding the supposed jealousy with which the Senecas guarded it.

. . . . .

One of the first legislative acts passed under Burnet had aimed to put a stop to the direct trade between the English and the French. It had long been the custom for Albany traders to carry English-made goods to Montreal, while selling them to the French, who in turn traded them to the Indians. The English could supply certain articles which were more to the savage taste than those sent over from France; and they could afford to sell them at a lower price. Having stopped the peddling to the French Governor Burnet made strong efforts to draw the far Western Indians to Albany for trade direct with them. In these efforts he was fairly successful. Bands of strange savages from Mackinac and beyond, accompanied by the squaws and papooses, presented themselves at Albany, where their kind had never been seen before. They had come down Lake Huron, past the French at Detroit, and through Lake Erie; and paddling down the swift reaches of the navigable Niagara had made the portage, reembarking below the heights and at the very doorway of the French trading-house; with some interchange, no doubt of jeers and imprecations, but none of furs for the French goods; and following the historic highways for canoes they skirted the Ontario

[1] Vaudreuil to the Minister, Oct. 15, 1712. In a subsequent letter, Nov. 6, 1712, Vaudreuil speaks of the band of Otagamis (i. e. Outagamis, otherwise Foxes or Sacs), led by one Vonnere, who lay in wait at the Niagara portage, so that an expedition for Detroit led by M. de Vincennes was sent by the Ottawa River route, "not only to avoid those savages, but to prevent the convoy from being pillaged by the Iroquois," etc. The name "Vonnere" is found elsewhere in the more probable form "Le Tonnerre," i. e. "Thunderbolt."

shore to the Oswego, then passed up that river, through Oneida Lake and down the Mohawk until they could lay their bundles of beaver skins before the English, on the strand at Albany. 1906 Severance

This was, indeed, a triumph of trade. They spoke a language which the traders there had never heard, but they brought many packs of furs; and, with perhaps, a double interpretation, the business sped to the entire satisfaction of the English. These people came in various bands; about twenty hunters, in the spring of 1722; and in the spring of 1723, over eighty, besides their numerous train of women and children; with sundry other parties following. They traveled over 1,200 miles to get to Albany.

. . . . .

There developed in England at this time a considerable outcry against the monopoly enjoyed by the Hudson's Bay Company; and an ingenious advocacy of free trade in North American fur-gathering. . . . Arthur Dobbs, who combined with the natural British hostility to the French a bitterly critical attitude towards the Hudson's Bay Company, set forth at length in his book views which no doubt met the approval of many of the British public of his day. Curiously enough, one of his strongest arguments was based on a map-maker's blunder. On the large map which accompanies his work, the Great Lakes are shown, with "the great fall of Niagara" properly indicated at the outlet of "Conti or Errie Lake." The whole region of the Lakes is shown, as accurately on the whole as on many another map, up to that time; but running into Lake Erie, a few miles south of the present site of Buffalo, the unknown geographer had added a stream of considerable size, and named it "Conde River." Its real prototype, in the annals of earlier explorers, may have been the Cattaraugus or Eighteen-Mile Creek; but here we have it, shown unduly large, as the only stream entering Lake Erie, its head-waters coming from vague mountains to the southeast.

Contemplating this stream, and the exigencies of the fur trade in the region, Mr. Dobbs saw a great opportunity for the British, "by forming a Settlement on the River Conde, which is navigable

1906
Severance

into the Lake Errie, which is within a small distance of our Colonies of Pennsylvania and Maryland, and being above the great Fall of Niagara, and in the neighborhood of the Iroquese, who are at present a Barrier against the French, and a sufficient protection to our Fort and trading House at Oswaga, in their Country upon the Lake Frontenac, who by that Trade have secured the Friendship of all the Nations around the Lakes of Huron and Errie. We should from thence, in a little Time, secure the navigation of these great and fine Lakes, and passing to the southward, at the same time, from Hudson's Bay to the Upper Lake, and Lake of Hurons, we should cut off the Communication betwixt their Colonies of Canada and Mississippi, and secure the Inland Trade of all that vast Continent." Further on we have more details, heal and imagined, of our region: "The Streight above Niagara at the Lake is about a League wide. From this to the River Conde is 20 Leagues South-west; this River runs from the S. E. and is navigable for 60 Leagues without any Cataracts or Falls; and the Natives say, that from it to a River which falls into the Ocean, is a Land Carriage of only one League. This must be either the Susquehanna or Powtomack, which fall into the Bay of Chisapeak." He further argues the wisdom of making a settlement on this wonderful river Conde, of building proper vessels there to navigate these lakes, so that "we might gain the whole Navigation and Inland Trade of Furs, etc., from the French, the Fall of Niagara being a sufficient Barrier betwixt us and the French of Canada," etc. It was alleged that the British Government might easily induce colonists from Switzerland and Germany "to strengthen our settlements upon this River and Lake Erie." Another suggestion was that disbanded British troops be sent on half pay to Lake Erie, where they would "make good our possessions, which would be a fine retreat to our Soldiers, who can't so easily, after being disbanded, bring themselves again to hard Labour, after being so long disused to it." The more Mr. Dobbs dwelt upon it the more important this particular project appeared. The French were to be cut off from com-

munication with the Mississippi; Canada was to be "made insig- 1906
nificant for the French." The entire free trade of North America Severance
was to fall into the hands of the English. And finally, with a burst of sentiment which recalls the devout aspirations of the French missionaries, but is an anomaly in the plans of British traders, he exclaims: "How glorious would it be for us at the same time to civilize so many Nations, and improve so large and spacious a country! by communicating our Constitution and Liberties, both civil and religious, to such immense Numbers, whose Happiness and Pleasure would increase, at the same Time that an Increase of Wealth and Power would be added to Britain." [1]

. . . . .

To the period we are now considering, belongs — if it belongs to history at all — the Niagara visit of the Sieur C. Le Beau, "*avocat en parlement*," romancer and adventurer at large. According to his own testimony, this young man, a native of Rochelle, went to Paris in 1729, and in the same year was drawn from his legal studies into a voyage to Canada. Shipwrecked in the St. Lawrence, he arrived at Quebec, in sad plight, June 18, 1729. He found employment as a clerk in the fur business ("*bureau du castor*") where he continued, making his home with the Recollect Fathers, for more than a year. He ran away from sober pursuits, in March, 1731 . . . and under sufficiently fantastic conditions. He was accompanied, with other Indians, by his mistress, an Abenaki maiden, with whom he had exchanged clothes. He had resorted to this and other disguise to avoid arrest by the French as a deserter. A long story is made of his encounter with soldiers from Fort Niagara, and of his final sanctuary in Seneca villages. He says that letters were received from Montreal, by the commandant at Fort Niagara, ordering his arrest, if he appeared in the neighborhood.

Needless to say, no mention of Le Beau is found in the official correspondence. His book has for the most part the air of truth;

[1] See "An account of the Countries adjoining to Hudson's Bay," etc., by Arthur Dobbs. Lond, 1744.

1906 Severance

he is precise with his dates, and in his account of Indian customs shows much accurate knowledge. Among the things that tell against him are his allusions to a Jesuit priest, Father Cirene, among the Mohawks; but this name is not found in all the Relations of the order. His account of Niagara Falls is dubious; he says they are 600 feet high. This is La Hontan's figure of many years before. Le Beau has much to say of La Hontan and his misrepresentations, but the indications are that he accepted one of that gay officer's wildest exaggerations, and that he may never have seen Niagara at all. He probably came to Canada, and had some experience among the Indians; and when he wrote his book, chose to so enlarge upon what he had really seen and experienced, still holding to a thread of fact, that the result has little interest as fiction, and no value whatever as history.

1907

1907

Niagara, and how to see it. Meetings of the S. A. F. and O. H. 1907. Pp. 33–34.

1907

Rebridging Niagara. (Harp. w., July 31, 1907. 41:756–762.)

With special reference to the new upper steel arch bridge just below the Falls.

1909

1909 Buffalo Historical Society

BUFFALO HISTORICAL SOCIETY. Publications. Vol. XIII. 1909. (See index for references to Niagara ship canal and effect of opening of Erie canal on the Niagara portage.)

1909 Severance

SEVERANCE, FRANK HAYWARD. Historical sketch of the board of trade, the merchants exchange, and the chamber of commerce of Buffalo. (Pub. Buff. hist. soc. 1909. 13:311–313.)

Opposition to the Niagara ship canal.

On one subject which came up time and again, championed by many boards of trade and individuals, both in and out of Congress, the Buffalo Board of Trade was uniformly and consistently obdurate. That was the Niagara Ship Canal. Ship canals around the falls had been proposed in very early days; and advocated, after surveys and elaborate reports, from 1835, at intervals through nearly four decades. In December, 1871, a Niagara

A Winter Scene at Niagara

Showing the effect of the frozen spray on trees in the vicinity

Ship Canal convention was held at Detroit. The Buffalo Board of Trade did not send delegates, but prepared instead an able argument against the proposed construction. This argument, in printed form, was laid before the convention. The Buffalo Board, while expressing a deep interest in all feasible projects for cheapening transportation, pronounced the Niagara Ship Canal unnecessary and useless in the attainment of that object. It protested against any Federal appropriation therefor, holding that the national finances did not warrant such an outlay, and — an even stronger argument — that if built, the canal would benefit foreign commerce at the expense of our own. It claimed that the true solution of the question which the Detroit convention had under discussion, was the improvement of the Erie Canal, and the cheapening of transportation from the West by that route. 1909 Severance

The outcome of the convention, in view of the wide attention which it attracted, and the heat which marked its deliberations, suggests the "ridiculous mouse" of old Æsop. Resolutions were adopted asking "Representatives in Congress to do all in their power to procure an appropriation" to build the canal. Nothing followed; and although the Niagara Ship Canal scheme is almost perennial in its cheerful reappearance, it is apparently as far from realization as it was in 1871, 1863, or 1835.

SYMONS, THOMAS W. The United States government and the New York state canals. (Pub. Buff. hist. soc. 1909. 13:131–133.) 1909 Symons

An account of federal action on a canal around Niagara Falls.

1910

FERNALD, FREDERICK ATHERTON. The index guide to Buffalo and Niagara Falls . . . Buffalo, N. Y.: F. A. Fernald. 1910. 1902 Fernald

Arranged on the dictionary or encyclopedia plan. Excellent articles on the Falls, the town and its industries, and all points of interest, scenic and historical, with several views.

1913

CUMBERLAND, BARLOW. A century of sail and steam on the Niagara river. Toronto. 1913. Pp. 31–32; 99–101; 121; 169. 1913 Cumberland

1913
Cumberland

Though devoted to the history of the Niagara river ports and especially to the rise of the Niagara Navigation Company, this volume incidentally contains interesting material, here and there, on travel conditions to, from and around the Falls.

The "Railroad Cars" were those of the "Buffalo and Niagara Falls Railroad" opened in 1836, then running two trains a day each way between Buffalo and the Falls, leaving Buffalo at nine in the morning and five in the afternoon. Manchester was the name of the town laid out in the neighborhood of the Falls, where from the abundance of water power it was expected a great manufacturing centre would be established.

An advertisement in a later year (1844) mentions the steamer "Emerald" to "leave Buffalo at 9 a. m. for Chippawa, arrive by cars at Queenston for steamer for Toronto, Oswego, Rochester, Kingston and Montreal."

The "cars" at Queenston were those of a horse railroad which had been constructed along the main road from Chippawa to Queenston, of which some traces still remain. The rails were long wooden sleepers faced with strap iron.

. . . . .

It was in this season of 1878 that the converging railways in the districts spreading from the south and southwest towards Buffalo, began a system of huge excursions for three days to Niagara Falls and return, on special trains both ways, and at rates for the round trip not far from, and often less, than single fare. Most of these separate railways have since been merged into some one or other of the main Trunk Lines, but then they were independent and each sending in its quota on its own account to make up a "Through Special." The most successful excursions of these were the series which came every week from the then Wabash District, from Indiana and the southwest, and were known as the "Friendly Hand" excursions. The name arose from a special trade mark which appeared in all the Wabash folders and announcements, of an outstretched hand with the thumb and fingers spread, on each of which was shown the line

and principal stations of each one of the contributing railways that fed their excursions into the main stem. The excursionists were energetic, and although the " Falls " was the focus of their route, we induced large numbers of them to cross over to Toronto. A prevailing slogan was: 1913 Cumberland

" One day to Falls,
One day to stay,
Next day Toronto
And then 'get away.' "

In those early days, before the " Park Commissioners " on both sides of the river had taken public possession of the surroundings, there were few places at the Falls from which either the river or the rapids could be seen without paying a fee. The proprietors of these places issued tickets in little books, containing coupons for admittance to all, or to a selection, of these " points of interest," and put them all in the hands of the managers of the excursions. The advertisement " dodgers " announced:

Special Inducement for this Excursion to the Falls

The Regular Prices for Admission are to

Suspension Bridge and Return	25c.
Prospect Park	25c.
Art Gallery	25c.
Museum and Operators	50c.
Garden of Living Animals	25c.

One ticket purchased on the train for $1.00
Admits the Holder to all these regular prices.

A good round commission on these sales was a helpful " find " or " side cut " to the energetic young railway men who personally accompanied these excursions through their trains, on the way to the Falls, carrying large satchels with their selections of " Points of Interest " and other tickets, and answering the multitude of enquiries made by their tourist patrons. An extension ticket to " Toronto and Return " was a pleasant addition to their wares, and a satisfactory introduction to us. . . .

. . . . .

1913
Cumberland

Under the hill there can be discerned beneath the shadow of the Height the old road leading up from the lower level of the dock to the upper level upon which, what is left of the Town of Queenston stands. It is marked and scarred with the ruts of many decades and full of memories. Upon these slopes the Indian made his way to the waterside at the Chippewa creek. Here came the trappers with their bales of furs brought down from the far North-West. Here came the *voyageur traders* of France with beads and gew-gaws for barter with the Indians, and later the English with blankets and firearms.

In the earliest days two portages were available, one on each side of the river, but during the French period and for long, long after the one on the east side from Lewiston was mainly used, its terminus at Lake Erie being called *Petite Niagara* as distinctive from the great *Fort Niagara* at its lower end.

1914

1914

Greater Buffalo and Niagara frontier. Commercial and industrial . . . Publicity committee of the Buffalo chamber of commerce. 1914.

"Some pertinent facts regarding industrial Niagara Falls."

1916

1916
Person

PERSON, C. W. Over the whirlpool by aerial cable. (Sci. Am., March 25, 1916. 114:330.)

A description with illustrations of an aerial scenic railway recently constructed over the whirlpool at Niagara.

The following titles contain no information in their imprints which makes it possible to assign even an approximate date for the publication. Under these circumstances it seemed best to list these together at the close of this chapter, with no attempt at a chronological arrangement for them.

No Date

Canal Board

CANAL BOARD. Proceedings. Report of the canal board on the Niagara ship canal.

Advocates enlarging the Erie canal in place of building a new and rival route around the Falls.

(The) Falls of Niagara depicted by pen and camera. Buffalo and N. Y.: Matthews, Northrup and Co. N.d.

A handsome book. The views are fine and the descriptions of the Falls are taken from those of various literary lights and famous visitors.

Grand trunk railway system. Across Niagara's gorge. (Battle Creek, Mich. N.d.)

A neat little booklet, beautifully illustrated, designed to serve as a souvenir of the steel arch bridge and of the Falls.

Guide to Niagara Falls. Niagara Falls: Niagara Falls Gazette. N.d.

HOOKER, SAMUEL. (Handbill advertising himself as guide to Niagara Falls.) Buffalo. N.d.

A list of minerals to be found at the Falls together with the specimens of animals and Indian antiquities to be seen there.

Michigan central railroad. Niagara Falls from many points of view. Chicago: Knight Leonard and Co. N.d.

Impressions of visitors and information for visitors.

New York central and Hudson river railroad company. Two days at Niagara Falls. (Four track ser. No. 9.) N.d.

Descriptive guide giving quotations and views.

New York central and Hudson river railroad, passenger department. Health and pleasure on "America's greatest railroad." (Four track series.) Pp. 159–162.

Niagara in summer and winter. No imprint.

Niagara (photographic views). No imprint.

(The) Niagara river from the rapids above the Falls to Lake Ontario. Buffalo and N. Y.: Matthews, Northrup and Co. N.d.

Advertisement of the Niagara Falls Park and River Railway showing the advantages accruing to the tourist from using the route in question.

(The) North American tourist. N. Y.: Goodrich. N.d. Pp. 85–92.

Descriptions of the various points of interest together with the best possible positions from which to view them.

Pocket guide to Niagara Falls. The complete illustrated guide to Niagara Falls and vicinity. No imprint.

Summary

In no phase of Niagara literature is a more complete change in conditions portrayed than in the writings cited in this chapter. To this generation, accustomed to the comforts of rapid transit, the accounts of horse-back and stage-coach trips of many miles to view the greatest natural wonder of this continent are most interesting. The earliest accounts dealing especially with the conditions of travel to the Falls are largely written from the point of view of possible trade with the district and contain information concerning roads and portage. The narrative of T. C. published in the Portfolio in 1810 is especially valuable for its accurate and clear account of the country traversed, the conditions of agriculture and trade, and the characteristics of the surrounding country and people.

Early in the nineteenth century the trip to the Falls became fashionable not only for European visitors, but also for the well-to-do class of our own country. This period gives us a number of personal reminisences taken from letters and diaries. The growing popularity of the trip also brought forth the publication of guide books describing the various routes to the Falls, and the sights to be seen there. From these early days of the nineteenth century down to the present time, the publication of guides to Niagara has been steady and continuous. In the earlier accounts we find mention of the trip by boat from one side of the river to the other, and in later years the descriptions of the bridges in accordance with the rapidly developing science of engineering. We also find interesting accounts of the first steamboats on the river, and the first railroads, with information about the beginnings and progress of the Niagara excursion movement.

The Niagara ship canal project was also productive of much writing in the shape of legislative documents, petitions of citizens, discussion of the engineers and boards of trade and the like. Along with the economic development of Niagara has arisen a species of advertising literature, some of it giving valuable

information regarding the cataract in conjunction with its details of power, situation, railroads, and accessibility.

It seems appropriate that after the gathering together of the description and discussions of Niagara comprised in the preceding chapters of this book, the work should close with those accounts which picture for us the difficulties and hardships encountered by early visitors to this great wonder of our world, the gradual improvement of travel conditions with the advance of science and transportation facilities, until now the opened road has made Niagara a universal goal for travellers.

PART OF THE AMERICAN FALL.
From the foot of the Stair Case
Painted by H. (sic) J. Bennett (1831?)
Engraved by J. Hill *Published by Henry I. Megarey, New York*

ALPHABETICAL LIST

Bibliography

Explanation of Signs and Abbreviations

When the name of the author has been unobtainable the title has been put in according to the initial letter of the first word, excluding the article, which is put in parentheses at the end of the title. If published under initials and the name of the author cannot be determined it has been placed in the order of the first letter of the initials. Brackets indicate material which has been supplied by the author for the purpose of filling out names, titles or words. Parentheses indicate material supplied by the author so as to make the information conveyed in the title more complete. They are also used to indicate the fact that the article or work indicated in the title appears in a periodical or collection of other material. Where no place or no date of publication is given it has been impossible to determine the same. The large Roman numerals at the extreme end of the title indicate the chapter of the Anthology in which a selection from the work is to be found.

A. N. C. Poem. (*In* Rolph, Thomas, A brief account together with observations, made during a visit in the West Indies, and a tour through the United States of America, in parts of the years, 1832–33; together with a statistical account of Upper Canada. Dundas, N. C.: Hackstaff, 1836. P. 196.) VIII

Abbott, Arthur Vaughan. Industrial Niagara. (R. of R., Sept. 1895. 12:295–299.) X

Abbott, Lyman. Niagara Falls in harness. (Outl., Nov. 16, 1895. 52:788.) X

Abdy, Edward Street. Journal of a residence and tour in the United States of North America, from April, 1833, to October, 1834. Lond.: John Murray. 1853. 1:286–294 XI

Abercromby, Ralph. Seas and skies in many latitudes; or, Wanderings in search of weather. Lond.: Stanford. 1888. Pp. 19–22 .. IV

Accurate map of the English colonies (An) in North America bordering on the river Ohio. 8 x 9½. (*In the* Universal mag. Lond.: J. Hinton. 1754. 15:241.) IX

Acetylene searchlights proposed for Niagara Falls. (W. elec. July 10, 1897. 21:22.)

Across Niagara's gorge. [Battle Creek, Mich.: W. C. Gage and Sons. (1897)] (No title page, title taken from cover.) XII

Adams, Alton D. The American and Canadian channels of Niagara Falls. (Elec. rev. Nov. 11, 1905. 47:739–742.)

—— The destruction of Niagara Falls. (Cass., Mar. 1905. 27: 413–417.) XI

—— Diversion of water from Niagara. (Elec. wld. & eng., Apr. 28, 1906. 47:875–876.) XI

—— How to save Niagara Falls. (Tech. wld., Oct. 1905. 4: 161–167.) XI

—— Niagara Falls already ruined. (Tech. wld., Apr., 1906. 5: 115–124.) XI

—— Niagara power at Goat Island. (Sci. Am., Apr. 15, 1905. 92:299.) X

—— Pipe line power in Niagara gorge. (Cass., Dec. 1905. 29: 126–131.) X

—— Power sites about Niagara Falls. (Sci. Am., Aug. 26, 1905. 93:155.) X

—— Proposed dam for Lake Erie. (Sci. Am., Feb. 10, 1906. 94:127.) X

—— Recession of Niagara Falls. (Sci. Am., Sept. 2, 1905. 93: 178.) VII

—— Utilizing the power of the Niagara rapids. (Eng. mag., June, 1905. 29:381–387.) X

—— Wheel pits and tunnels for Niagara power. (Elec. rev. May 20, 1905. 46:805–809.) X

Adams, John Quincy. [Speech on Niagara Falls.] (*In* A souvenir of Niagara. Buffalo: Sage. 1864. P. 128.) IV

Additional Niagara power for Buffalo. (W. elec. Dec. 4, 1897. 21:317.).

Aesthetic versus the economic value of the Falls (The). (Sci. Am. sup., July 7, 1906. 62:25506–25507.)

Agassiz, Garnault. Niagara — the "Mighty Thunderer." A reprint from the National magazine for September, 1912 X

Agassiz, Louis. Lake Superior; its physical character, vegetation, and animals, compared with those of other and similar regions. With a narrative of the tour by J. Elliot Cabot. . . . Bost.: Gould, Kendall and Lincoln. 1850. Pp. 12–20 VI

Age of Niagara (The), (Pub. opin., Oct. 29, 1896. 21:560.) .VII

—— [A review of Spencer's 'Duration of Niagara Falls.'] (Geog. jour. (Lond.:) Feb., 1895. 5:172–173.) VII

Age of Niagara (The), (Nature, Nov. 1898. 59:16.).....VII

Alberger, F. A. Speech on the Niagara ship canal bill, before the house of assembly, March 20, 1872. Albany: Weed, Parsons and Co. 1872.....XII

Album of the Table Rock, Niagara Falls, and sketches of the Falls and scenery adjacent. Buffalo: Jewett, Thomas. 1848.....XII

Alec-Tweedie, *Mrs.* E. America as I saw it; or, America revisited. N. Y.: Macmillan. 1913. Pp. 347–356.....IV

Alexander, James Edward, *Captain.* Transatlantic sketches, comprising visits to the most interesting scenes in North and South America, and the West Indies. Lond.: Richard Bentley. 1833. 2: 141–156.).....III and VII

(Alexander, J. S.) Wonders of the west, or a day at the Falls of Niagara, in 1825. A poem, by a Canadian. N. Y.: 1825....VIII

Alida; or, Miscellaneous sketches of incidents during the late American war founded on fact. With poems. By an unknown author. 3d. ed. rev. & imp. N. Y.: Printed for the author. 1841. Pp. 183–191.....VIII

Allard, Carl. Recentissima novi orbis, sive Americae Septentrionalis et Meridionalis tabula. (*In his* Atlas minor. . . . Amstelo-dami. Ex officina Caroli Allard. [1696] No. 138.).....IX

Allen, H. T. Allen's illustrated guide to Niagara; revised and published by H. T. Allen. Buffalo: 1881.....XII

Allen, Stephen M. Address on the occasion of the opening of navigation to Niagara Falls, July 4, 1857. Niagara Falls: Pool and Sleeper. 1857.....XII

Allis, Almon Trask. Uncle Alvin at Niagara. (*In his* Uncle Alvin at home and abroad. Hornellsville. 1895. Pp. 112–134.)..VIII

Almy, Frederic. What to see. (*In* The Niagara book. N. Y.: Doubleday, Page and Co. 1901. Pp. 3–28.).....XII

Along the Niagara-Toronto transmission line. (Elec. wld. & eng. Sept. 16, 1905. 46:470–481.)

Aluminum as a conductor of electricity. (Jour. soc. chem. ind., Jan. 30, 1897. 16:73.)

Aluminum company of America. (Harp. w., June 14, 1913. 57, pt.1:25.).....X

American civic association. The impending destruction of Niagara Falls. Statement submitted to President Roosevelt. . . . Phila.: 1905.

—— Niagara again. [1908].....XI

American Civic Association. A Niagara emergency message for instant consideration by every member of the American civic association. [Harrisburg, 1909] XI

—— [Preservation of Niagara Falls] (Clipping sheet, 2d ser., no. 6, Apr. 18, 1908) XI

—— Preservation of Niagara Falls: memorandum submitted on behalf of the people of the United States, at the hearing held Nov. 26, 1906, before the Hon. W. H. Taft, secretary of war, in the matter of the admission of electric power generated in Canada from the water of the Niagara River. [1906] XI

American Gazetteer (The). Containing a distinct account of the New World . . . Lond.: A. Millar and J. and R. Tonson. 1762. Vol. III V

American guide-book (The); being a hand-book for tourists and travellers through every part of the United States. . . . Phila.: George S. Appleton. 1846. Pt. 1, Pp. 145–156 XII

American institute of homeopathy. Sixtieth annual conference. Niagara Falls. June 20–25, 1904 XII

American library association. Twenty-fifth annual conference. Niagara Falls, June 22–27, 1903. Buffalo: Matthews Northrup and Co. 1903 XII

American sketches, by a native of the United States. Lond: John Miller. Pp. 233–249 III

Ampere, Jean Jacques Antoine. Promenade an Amérique . . . Paris: Michel Lévy frères. 1855. 1:162–170 IV

Andrews, William C. How Niagara has been "harnessed." (R. of R., June, 1901. 23:694–697.) X

Annotated time table of the tour through Canada of their Royal Highnesses the Duke and Duchess of Cornwall and York . . . October, 1901 IV

Annual register . . . of the year 1759. 4th ed. Lond.: J. Dodsley. 1765. 2:32 V

Another development of Niagara power planned. (Elec. wld. Jan. 14, 1899. 33:49.)

Anville, Jean Baptiste Bourguignon d'. Amérique Septentrionale. 1746. (*In his* Atlas général. 1727–80. No. 10.) . . . IX

—— America Septentrionalis a domino d'Anville in Galliis edita nunc in Anglia coloniis in interiorem Virginiam deductis nec non fluvii Ohio cursu austa notio geographicis et historicis illustrata sumptibus Homannianorum Heredum Noribergae ao 1756 IX

Anville, Jean Baptiste Bourguignon d'. Canada, Louisiane et terres Angloises. (*In his* Atlas général. 1727–80, No. 32.) . . . IX

—— North America, from the French of mr. D'Anville. Improved with the back settlements of Virginia and course of Ohio. . . . (*In* Jefferys, Thomas, The natural and civil history of the French dominion in North and South America. Lond.: 1760. Pt. I. Opp. p. 134.) IX

—— North America. From the French of mr. d'Anville. Improved with the back settlements of Virginia and the course of the Ohio. Illustrated with geographical and historical remarks. (*In* Jefferys, Thomas, A general topography of North America and the West Indies. . . . Lond.: Printed for Robert Sayer and Thos. Jefferys. 1768. No. 7.) IX

—— North America from the French of mr. D'Anville. Improved with the English surveys made since the Peace. 1763. (*In* Mills, David, A report on the boundaries of Ontario. Toronto: 1873.) IX

—— A particular map of the American lakes, rivers, etc. Par le Sr. d'Anville de l'Academie R'le des Inscriptions et Belles Lettres et de celle des Sciences de Petersbourg. Secretaire de M'gr. le Duc d'Orleans. Lond.: Drawn and engraved for John Harrison, June 25, 1790. (Grosvenor library. Buffalo, N. Y. Maps, historical and miscellaneous. No. 82.) IX

Anzi, Conte Aurelio Delgi. Nuova Francia e Luigiana, 8¾x11½. (*In* Zani, Valerio, Il genio vagante. Biblioteca curiosa di cento a più relazioni di viaggi [etc.] raccolta dal signor conte Aurelio delgi Anzi, (pseud.) Parma per I. & F. M. Rosati, 1691–1693. Pt. 2. bet. pp. 422–423.) IX

Appleton's new and complete United States guide book for travellers. N. Y.: D. Appleton and Co. Phila.: Geo. S. Appleton. 1850. Pp. 209–217 XII

—— Railroad and steamboat companion. N. Y.: D. Appleton and Co. Phila.: Geo. S. Appleton. 1847. Pp. 185–193 XII

Appleton, Thomas Gold. Goat Island, Niagara. (*In his* Faded leaves. Bost.: Roberts Bros. 1872. P. 33.) VIII

—— Niagara. (*In his* Faded leaves. Bost.: Roberts Bros. 1872. Pp. 27–30.) VIII

Application of Niagara power to the work of the International Traction Co. (The). (St. ry. jour. Feb. 3, 1900. 16:103–109.)

Applications of the Niagara power. (Eng. news, Aug. 1, 1895. 34:64.)

"Aquarius." Thoughts at Niagara. (Knick. mag. Sept. 1843. 22:193–196.) V

Archaelogia Americana. (Worcester, Mass.: 1820. 1:67–68.) . .I

Archer, J——. Niagara Falls. As seen from below. Painted by Wall. 6 x 9½. (*In* Hinton, J. H., ed., History and topography of the United States. New ed. Boston: Samuel Walker. 1834. 1: opp. 348.) IX

Arfwedson, Carl David. The United States and Canada in 1832, 1833, and 1834. Lond.: Richard Bentley. 1834. 2:312–326. .III

Argyll, Duke of. First impressions of the new world. (Lit. liv. age, Jan. 3, 1880. 144:38–40.) IV

Arnold, *Sir* Edwin. Seas and lands. N. Y.: Longmans, Green. 1891. Pp. 41–44.....IV

Arnot, Raymond H. The industries of Niagara Falls. (Pop. sci. Oct., 1908. 73:306–318.) X

Art on Niagara Falls; quotes description of Horatio Gates Strafford, in his gazetteer of New York of 1824, at length. Albany. 1842. Pp. 289–291.

Articles of incorporation, together with the by-laws of the Niagara Falls water power co., as amended April 11, 1857, N. Y. Baker and Goodwin. 1857.....X

Atkins, Barton. The river Niagara: descriptive and historical. Pan-American edition. Buffalo: 1899.....V

Attempt to save Niagara (The). (Cent. April, 1885. [new ser. 7] 29:954–955) XI

Aubert, F. Transport de force par l'électricité des chutes du Niagara à Buffalo. (Le Genre civil. July 24, 1897. 31:201–202.) X

Audubon, John James. Audubon and his journals, by Maria R. Audubon; with notes by Elliott Coues. N. Y.: Scribner. 1897. 2:286–288 VI

—— Ornithological biography. Edin.: Adam Black. 1831. 1:362–363 VI

Austin, Henry. Niagara. (Indep., Nov. 29, 1900. 52. 2867.) VIII

Avary, Harper L. Niagara as a dynamo. (Illus. Am. Dec. 26, 1896. 21:7–8.)

Babcock, James Staunton. Niagara. (*In his* Visions and voices. Hartford: Hunt. 1849. Pp. 131–132.) VIII

Baclé, L. L'utilisation de la force hydraulique des chutes du Niagara. (Le Genre civil. Sept. 24, 1892. 21:342–345.) X

Bacon, Ezekiel. Aegri Somnia; recreations of a sick room. N. Y.: J. Allen. 1843. Pp. 105–107.....VIII

Baird, Robert. Impressions and expressions of the West Indies and North America in 1849. Edinb. and Lond.: Blackwood and Sons. 1850. 2:79–95.....IV

Baker, Naaman R. An ode to Niagara. (*In his* Constancy and other poems. Mt. Morris. 1894. P. 48.).....VIII

Bakewell, Robert, Jr. Observations on the Falls of Niagara, with reference to the changes which have taken place and are now in progress. (Am. jour. sci., 1857. 73:85–95.).....VII

—— Observations on the whirlpool and the rapids below the Falls of Niagara. (Am. jour. sci. 2d ser. 1847. 4:25–36.).....VII

—— On the Falls of Niagara and on the physical structure of the adjacent country. (Loudon's mag. of nat. hist. Jan,. 1830. 3:117–130.).....VII

Ballou, Maturin M. Footprints of travels; or, Journeyings in many lands. Bost.: Ginn. 1889. P. 2.....IV

Ballou, William Hosea. Niagara river. (Sci. Am. sup. Jan. 1, 1882. 13:5045–5046.).....VII

[Bamburgh, William Cushing]. Niagara Falls from uncommon points of view. N. Y.: Phoenix art pub. co. 1893.....IX

Banks, George Linneaus *ed.* Blondin, his life and performances. Lond.: Routledge, Warne and Routledge. 1862. Pp. 32–41.

Barber, John W. *and* **Howe, Henry.** Historical collections of the State of New York. N. Y.: S. Tuttle. 1841. Pp. 352–357....V

Barham, William. Descriptions of Niagara; selected from various travellers: with original additions. Gravesend: n. d. Pp. 102–105; 157–159.....XII

Barhite, John A. Report to the constitutional convention of the subcommittee of the committee on legislative powers relative to the diversion of the waters of Niagara. (Ann. rept's of the com'rs of the state reserv. at Niagara. Albany: 1895. 11:61–73.).....XI

Barker, George. The redemption of Niagara.— Views near the Cataract.— From photographs and sketches by George Barker, Niagara Falls. (Harp. w., July 18, 1885, 29:460–461, 466.).....XI

Barlow, Jool. The Columbiad. Lond.: 1809. P. 29.....VIII

Barlow, John R. John's trip; or, A visit to Niagara Falls. A seriocomic poem in four cantos. Niagara Falls: William Pool. 1871.VIII

Barlow, John Richard. The maiden of the mist; an Indian legend of Niagara: (origin of the great paintings the Red man's fact and the White man's fancy.) Niagara Falls, N. Y.: Niagara Courier Press. 1908 VIII

Barlow, Peter W. Concluding observations and deductions on the Niagara bridge. (Jour. Frank. inst. Mar., 1861. 71:160–165.) . XII

—— Observations on the Niagara bridge. (Jour. Frank. inst. Jan. 1861. 71: 16–32.) XII

—— Observations on the Niagara railway suspension bridge. (Jour. Frank. inst. Feb., 1861. 71: 237–238.) XII

—— On the mechanism of bridges. (Jour. Frank. inst. Feb., 1861. 71: 89–93.) XII

Barlow, W. H. The upward jets of Niagara. (Jour. Frank. inst., Oct. 1877. 104: 275–277.) VII

Barralet, John James (del.) Lawson (sculpt.) View of the Falls of Niagara. (Grosvenor library, Buffalo, N. Y. Views of Niagara Falls. 1697–187–. Mat 7.) IX

Bartlett, W. H. The Horse Shoe Fall, Niagara — with the tower. 7 x 4½. (*In* American scenery. From drawings by W. H. Bartlett. The literary department by N. P. Willis. Lond.: G. Virtue. 1840. 1: 32.) IX

—— The landing on the American side. (Falls of Niagara.) 7 x 4¾. (*In* American scenery. From drawings by W. H. Bartlett. The literary department by N. P. Willis. Lond.: G. Virtue. 1840. 1: 97.) IX

—— Niagara Falls. (From near Clifton house.) — Chutes de Niagara vues près de Clifton house.— Der wasserfall Niagara vom Cliftonchen hotel gesehen. 7 x 4½. (*In* American scenery. From drawings by W. H. Bartlett. The literary department by N. P. Willis. Lond.: G. Virtue. 1840. 1:45.) IX

—— Niagara Falls from the ferry. 7 x 4½. (*In* American scenery. From drawings by W. H. Bartlett. The literary department by W. P. Willis. Lond.: G. Virtue. 1840. 1: 4.) IX

—— Niagara Falls. (From the top of the ladder on the American side.) 7½ x 4¾. (*In* American scenery. From drawings by W. H. Bartlett. The literary department by N. P. Willis. Lond.: G. Virtue. 1840. 2: 12.) IX

—— The rapids above the Falls of Niagara. 7 x 4½. (*In* American scenery. From drawings by W. H. Bartlett. The literary department by N. P. Willis. Lond.: G. Virtue. 1840. 1: 16.) IX

Bartlett, William H. Views of Niagara Falls. (Grosvenor library, Buffalo, N. Y. Views of Niagara Falls. 1697–187–. Mat 13, and 13a.) IX

Barton, Benjamin Smith. Description of the Falls of Niagara. (Phila. med. and phy. jour. Phila.: J. Conrad and Co. 1804. 1:pt. 1, pp. 39–47.) VII

Barton, James L. Address on the early reminiscences of western New York and the lake region of country. Delivered before the Young men's association of Buffalo, February 16, 1848. Buffalo: Jewett, Thomas and Co. 1848. Pp. 15–18, 61–64 XII

Barton, Philip P. Niagara Falls power. The organization of the operating department of the Niagara Falls power company. (Cass. Jan., 1902. 21:179–205.) X

Bartram, John. Observations on the inhabitants, climate, soil, rivers, productions, animals, and other matters worthy of notice. Made by Mr. John Bartram, in his travels from Pensilvania to Onondago, Oswego and Lake Ontario, in Canada. To which is annex'd, a curious account of the cataracts at Niagara. By Peter Kalm . . . Lond.: Whiston and White. 1751. Pp. 79–94.

Bates, Katharine Lee. The song of Niagara. (Can. mag. May, 1910. 35:58.) VIII

Bauer, W. C. Niagara in winter and Niagara in summer IX

Baxter, W. E. America and the Americans. Lond.: George Rutledge and Co. 1855. Pp. 223–226 ..... IV and VI

Beardsley, Levi. Reminiscences . . . N. Y.: C. Vinten. 1852. Pp. 147–150 V

Beaurain, Chr. de. Carte de l'Amerique Sept'le pour servir à l'intelligence de la guerre entre les Anglois et les Insurgents Dediée à Mgr. de Sartine, Ministre de la Marine par M. le Chr. de Beaurain. Geographe du Roi, et son pensionnaire. 1777 IX

Beauty of Niagara and its power, (The). (Elec. rev., June 27, 1903. 41:1098.) XI

Beck, Adam. The public interest in the Niagara Falls power supply; speech in the Legislature, May, 1905. Embodying the views of the government of Ontario. Toronto: Cameron. 1905.

Beck, Raphael. Niagara Falls. (Painting.) IX

Beers, J. H. History of the Great Lakes. Chicago: Beers. 1899. 1:27–32 V

Begg, Mary Millar. Niagara. (*In her* My mother's marriage ring and other poems. Glasgow: Bryce. 1893. P. 100.) VIII

Behrend, B. A. A new large generator for Niagara Falls. (Trans. Am. inst. elec. engrs., Atlantic City, July 1, 1908. 27, pt. 2:1057–1068.) X

Bell, Louis. Two aspects of "Conservation" and the Niagara power situation. (Metal. & chem. eng. Nov., 1912. 10:714.)

Bellin, N——. Carte de l'Amérique Septentrionale. 1743. (*In* Charlevoix, Pierre Francois Xavier de, Histoire de la Nouvelle France. A Paris: Chez Nyon fils. 1744. I, Front.) IX

—— Carte de l'Amérique Septentrionale. 1743. (*In* Charlevoix, Pierre Francois Xavier de, History and general description of New France, ed. by J. G. Shea. N. Y.: Harper. 1900. 1:100.) . .IX

—— Carte de l'ocean occidental et Partie de l'Amerique Septentrionale. 1744. (*In* Charlevoix, Pierre Francois Xavier de, Histoire de la Nouvelle France. A Paris: Chez Nyon fils. 1744. Vol. III, Front.) . .IX

—— Carte de la Louisiane, cours du Mississipi et pais voisins. Dediée à M. le Comte de Maurepas, Ministre et Secretaire d'etat Commandeur des Ordres du Roy. Par N. Bellin. Ingenieur de la Marine. 1744.IX

—— Carte de la Louisiane, cours ou Mississipi et pays voisins. 1744. (*In* Charlevoix, Pierre Francois Xavier de, Histoire de la Nouvelle France. Á Paris: Chez Nyon fils. 1744. Vol. II. Front.) IX

—— Carte de la Louisiane cours du Mississipi et pais voisins. 1744. (*In* Charlevoix, Pierre Francois Xavier de, History and general description of New France, ed. by J. G. Shea. N. Y.: Harper. 1900. 6:10–11.) IX

—— Carte des cinq grands lacs du Canada. (*In his* Le petit atlas maritime . . . 1764. 1:6.) IX

—— Carte des lacs du Canada. (*In* Charlevoix, Pierre Francois Xavier de, Histoire de la Nouvelle France. Á Paris: Chez Nyon fils. 1744. 3:276–277.) IX

—— Karte des abendlaendischen weltmeeres, und eines theils von dem mitternaecheigen America: gezeichnet zum nähern verständniss der im jahr 1720 gethanen reise des ehrw: vaters de Charlevoix priesters der gesellschafft Jesu, in die länder Canada, Louisiana und San Domingo: durch N. Bellin. 1744. 8½ x 14½. (*In* Schröter, Johann Friedrich, Allgemeine geschichte der länder und völker von America. Nebst einer vorrede Siegmund Jacob Baumgartens.— (anon) Halle: J. J. Gebauer. 1753. 2:478.) IX

—— La nouvelle France ou Canada. (*In his* Le petit atlas maritime. Receuil de cartes et plans des quatre parties du monde. Par le S. Bellin. 1764. Vol. I, No. 4.) IX

Belt, Thomas . . . Niagara: glacial and post-glacial phenomena. (Quarterly jour. sci. Lond.: April, 1875. Pp. 135–156.) VII

Bennett, W. C. Snatched from Niagara. (Belgravia. Midsummer holiday no. 1878. Pp. 90–97.) VIII

Bennett, W. J. View of the American Fall. Published by Megarey. (1831?) IX

—— Part of the American Fall. Published by Megarey. (1831?) . IX

—— View of the British Fall. Published by Megarey. (1831?) . IX

—— Part of the British Fall. Published by Megarey. (1831?) . IX

Benwell, J. An Englishman's travels in America, with observations. Lond., Goodwin. 1853. Pp. 45–47 IV

Bernard, Duke of Saxe-Weimar Eisenach. Travels through North America, during the years 1825 and 1826. Phila.: Carey, Lea and Carey. 1828. 1: 75–78 III

Bernard, J. F. Le cours de fleuve Missisipi, selon les relations les plus modernes. Amsterdam: chez J. F. Bernard. 1737 IX

Berry, C. B. The other side: how it struck us. Lond.: Griffith and Farran. 1880. Pp. 170–183 XI

Bianchi, Alberto G. Los Estados Unidos. Descripciones de Viaje. Editor, N. Lugo Vina. Mexico. 1887. Pp. 146–158 IV

Biart, Lucien. A travers l'Amérique, nouvelles et recits . . . Paris: Bibliothéque du Magasin des Demoiselles. 1876. Pp. 89–94 . . . IV

Bickersteth, M. Extract from "Japan as we saw it." (Ann. rep't of the com'rs of the state reserv. at Niagara. Albany. 1895. 11: 59.) V

Bickford, E. L. T. Harris. The Falls of Niagara. (*In his* Gold — the god and other poems. Camborne: author. n. d. Pp. 113–118.) VIII

Biddle, Horace P. Niagara. (*In his* Poems. N. Y.: Riverside Press. 1872. P. 237.) VIII

Bierstadt, E——. American Falls from Goat Island. (Grosvenor library, Buffalo, N. Y. Views of Niagara Falls. 1697–187–. Mat 18.) IX

"Big Falls" (The). (Once a wk. July 19, 1873. 29: 50.) . . . V

Big power station at Niagara Falls. (W. elec. Dec. 18, 1897. 21: 342.).

Bigelow, Timothy. Journal of a tour to Niagara Falls in the year 1805. Bost.: John Wilson and Son. 1876. Pp. 56–68 III

Bigney, M. F. Visit of the sunbeams to the Falls of Niagara. (*In his* The forest pilgrims, and other poems. New Orleans: Gresham. 1867. Pp. 98–99.) VIII

Bigot, Charles. De Paris au Niagara: Journal de voyage d'une delegation. Paris: A. Dupret, editeur. 1887. Pp. 140–156. . XI

Bigsby, John J. The shoe and canoe . . . Lond.: Chapman and Hall. 1850. 2:1–34 IV

[Bill for the preservation of Niagara Falls, The.] (Eng. news. June 7, 1906. 55:642.) XI

Billardon de Sauvigny, Edme Louis. Hirza, ou Les Illinois, tragédie. Représentèe, pour la première fois, par les comediens ordinaires du Roi, le mercredi 27 Mai 1767. Paris: La veuve Duchesne. 1780. Pp. 3–4 VIII

Bingley, William. Travels in North America, from modern writers. With remarks and observations, exhibiting a connected view of the geography and present state of that quarter of the globe. Designed for the use of young persons. Lond.: 1821. Pp. 37–40 V

Birch, T. Falls of Niagara from the American ladder. (Grosvenor library, Buffalo, N. Y. Views of Niagara Falls. 1697–187–. Mat 16.) IX

Bird, James. Francis Abbot; the recluse of Niagara, and metropolitan sketches. 2d ser. Lond.: Baldwin and Cradock. 1837. Pp. 1–93 VIII

Birdseye view of Niagara Falls and surrounding country. (Grosvenor library, Buffalo, N. Y. Views of Niagara Falls. 1697–187–. Mat 18.) IX

Birkinbine, John. Proposed water-power improvement in the gorge of the Niagara River, New York. (Proc. engrs. club, Phila., Jan., 1899. 16: 38–45.) X

Birkinbine plan for utilizing Niagara gorge power (The). (Elec. eng. N. Y. Feb. 9, 1899) X

Bishop, Irving. The red book of Niagara. A comprehensive guide to the scientific, historical and scenic aspects of Niagara. For the use of travellers . . . Buffalo: 1902 XII

Blackwell, E. R. *and* Allen, Z. On the volume of the Niagara river, as deduced from measurements made in 1841 by Mr. E. R. Blackwell and calculated by Z. Allen. (Am. jour. sci., (Oct.–Dec., 1843) 46: 67–73.) VII

Blake, Henry T. Ode to Niagara Falls. (Jour. Am. hist. Jan., 1907. 1:141–142.) VIII

Blanchard, Amy Ella. A loyal lass, a story of the Niagara campaign of 1814. Boston & Chicago: W. A. Wilde Co. (1902) VIII

Blanchard, Frank Leroy. Niagara power at Buffalo. (Harp. w., June 5, 1897. 41:569–570.) X

Blane, William Newnham. An excursion through the United States and Canada during the years 1822–1823. Lond.: Baldwin, Craddock and Joy. 1824. Pp. 393–406, III; also pp. 405–406. . . VI

Blouet, A——. (del.) General view of the Falls taken from the Canada shore. (Print.) IX

—— View of the central fall taken from Goat Island. (Print.) . . IX

—— View of the great Horseshoe Fall taken from Goat Island. (Print.) IX

—— View of the passage under the great Horseshoe Fall taken from the shore on the Canada side. (Print.) IX

—— Vue de la chute de Schlosser prise de la rive de l'etat de New York. (Print.) IX

Blume, Justice Jarvis. Across Niagara on a man's back. No publisher. N.d. ..... V.

Boddam–Whetham, J. W. See Whetham, J. W. Boddam.

Bodenstedt, Frederick. Niagara. (*See* Michigan Central Railroad Company. From city to surf . . . Chicago: Rand, McNally. 1888. Pp. 67–68.) VIII

—— Niagara. (*In* Ott, Adolph *and* Palmer, Hans, Nordamerika. Vereinigte staaten von Amerika . . . Bern: Rydegger und Baumgart. 1887. P. 503.) VIII

Bodmer, Charles. View of Niagara Falls. (*In his* Atlas of eighty-one plates to accompany Wied-Neuwied, M. A. P. von Prinz. Travels in the interior of North America. Lond.: Ackermann & Co. 1843. Plate No. 39 IX

Boehmio, August Gottlieb. Americae mappa generalis secundum legitimas projectionis stereographicae regulas relationesque recentissimas et observationes socioru acad, reg. sequae Parisiis est aliorumque auctorum nec non secundum mentem D. I. M. Hasii m. p. p. in partes suas methodicas divisa nunc concinnata et delineata ab Aug. Gottl. Boehmio. Phila. mag. istro. In lucem proferentibus Homannianis Heredibus. A. 1746. (Maps of Am. I, No. 18.) IX

Bogart, John. Feats of railway engineering. (Scrib. mag. July, 1888. 4:1–34.) XII

—— Letter as to the diversion of water near Niagara Falls. (Ann. rep'ts of the com'rs of the state reserv. at Niagara. Albany: 1891. 7:117–118.) X

Bogart, John. Report on the outline of the crest of the falls of Niagara in 1890, and the recession of the falls since 1842. (Am. rep'ts of the com'rs of the state reserv. at Niagara. Albany: 1891. 7:89–94.) .VII

Bolton, Reginald Pelham. An expensive experiment; the hydro-electric power commission of Ontario. N. Y.: Baker & Taylor co. 1913 X

Bonaldi, Juan Antonio Parez. El poema del Niagara. 2d ed. N. Y.: 1883.....VIII

"Bonfils." Vue d'une partie des deux Branches de la Cataracte de Niagara; *and* Vue d'une partie de la Branche Occidentale de la Catarcte de Niagara. (*In* Crévecouer, H. St. John de, Voyage dans la haute Pensilvanie et dans l'etat de New York, par un membre adoptif de la nation Oneida . . . Paris: De Crapulet. 1801. 2:148–193.) IX

—— Vue d'une partie des deux Branches de la Cataracte de Niagara; *and* Vue d'une partie de la Branche Occidentale de la Cataracte de Niagara. (Grosvenor library, Buffalo, N. Y. Views of Niagara Falls. 1697–187–. Mat 7.).....IX

Bonnécamps, Joseph Pierre de. Account of the voyage on the Beautiful river made in 1749, under the direction of Monsieur de Celoron, by Father Bonnécamps. (Thwaites, Jesuit Relations, LXIX, p. 159.).....I

B[onnefons], J. C. Voyage au Canada dans le Nord de l'Amerique Septentrionale fait depuis l'an 1751 a 1761. Quebec: Imprimerie Léger Brousseau. 1887. (Abbé H. R. Casgrain, ed.) P. 57–61 I

Bonnycastle, *Sir* Richard H. The Canadas in 1841. Lond.: Henry Colburn. 1842. 1:215–260.....IV, XII

—— Canada and the Canadians. New ed. Lond.: Colburn. 1849. 1:233–244 XI

Bornet, John. Niagara Falls, American side. Published by Goupil & Co., 772 Broadway, N. Y.: 1855.....IX

Borrett, George Tuthill. Letters from Canada and the United States. Lond.: Printed for private circulation by J. E. Adlard. 1865. Pp. 52–62.....IV

Bouchette, Joseph. The British dominions in North America; or a topographical and statistical description of the provinces of Lower and Upper Canada, New Brunswick, Nova Scotia, the islands of Newfoundland, Prince Edward and Cape Breton, including considerations on land-granting and emigration . . . Lond.: Longman, Reese, Orme, Brown, Green, and Longman. 1832. 1:138–147.....VII

Bourne, Edward G. The recession of Niagara gorge. (Nature, Apr. 2, 1891. 43:515.).....VII

Bowen, Emanuel. A map of the British American plantations, extending from Boston in New England to Georgia, including all the back settlements in the respective provinces as far as the Mississipi. 8½ x 11. (*In* the London mag. Lond.: For J. Astley. [1749] July, 1749. 18: opp. 308.).....IX

—— A new and accurate map of Louisiana with part of Florida and Canada. (*In his* Complete atlas, or distinct view of the known world. 1752. No. 57.).....IX

—— ***and* Gibson, John.** An accurate map of North America. Describing and distinguishing the British, Spanish and French dominions on this great continent; according to the definitive treaty concluded at Paris, 10 feb. 1763. (*In* Jefferys, Thomas, General topography of North America and the West Indies. Lond.: Printed for Robert Sayer and Thomas Jeffreys. 1768. No. 9.).....IX

—— An accurate map of North America. Describing and distinguishing the British, Spanish, and French dominions on this great continent, exhibiting the present seat of war and the French encroachments; also all the West India Islands . . . (1755?) (Am. maps, I, No. 20.).....IX

—— An accurate map of North America, describing and distinguishing the British and Spanish dominions . . . also all the West India Islands . . . (Am. maps II, No. 26–27.).....IX

Bowman, A. A. Power development at Niagara Falls. (Can. eng. Nov., 1902. 9:295–297.).....X

Bradford, Thomas Gamaliel. Niagara Falls anl vicinity. 2 x 2¼. (*In his* Comprehensive atlas, geographical, historical and commercial. Bost.: Am. Stationers Co. 1835. P. 56.).....IX

Brainard, John Gardiner Calkins. Niagara. (*In* Church, F. E., The great fall, Niagara. N. Y.: 1857. P. 3.).....VIII

—— Poems . . . Hartford: Edward Hopkins. 1842. P. 10.VIII

Brandenburg, Broughton. Carnival of ice at Niagara. (Harp. w., Dec. 24, 1904. 48:1990–1994.).....V

Bremer, Frederika. The homes of the new world. Lond.: Hall, Virtue and Co. 1853. 2:194–202.....IV

Bressani, Francesco Giuseppe. A brief account of certain missions of the Father of the Society of Jesus in New France, by Father Francesco Giuseppe Bressani, of the same Society, to the most eminent and reverend signor, Cardinal de Lugo. At Macerata, by the heirs of Agostino Grisei. 1653. (Thwaites, Jesuit Relations, XXXVIII, pp. 235–237.)...I

[Brewer, ——.] A description of the Mammoth Cave of Kentucky, the Niagara River and Falls, Mount Vernon, etc., etc., to illustrate Brewer's panorama. Phila.: U. S. Job Printing office. 1849. P. 8–12 IX

Brewer, William H. Earth tremors at Niagara Falls. (Yale sci. mo. May, 1896. 2: 329–334.) VII

Brice, Andrew. Universal geographical dictionary . . . Lond.: Robinson and Johnston. 1759. P. 260 V

Bridges of Niagara gorge (The). (Sci. Am. June 17, 1899. 80: 296–297.) XII

Brief history of the power development at Niagara (A). (Cutter's guide to Niagara Falls, and adjacent points of interest. Cutter's guide pub. co. 1897. Pp. 65–75.)

British Canadian (A). The tour of H. R. H. the Prince of Wales through British America and the United States. Montreal: John Lovell. 1860. Pp. 187–188 IV

Broadhurst, William G. A dry Niagara. February 14, 15, 16, 1909. (Eng. news, Mar. 4, 1909. 61:227.) XI

Brookes, R. The general gazetteer; or, Compendious geographical dictionary, in miniature . . . Now much improved, and brought down to the present time, under the direction and inspection of the Rev. Jedidiah Morse. Lond.: J. Newberry. 1762 V

Brown, Curtis. The diversion of Niagara. (Cosmop., Sept., 1894. Pp. 526–545.) X

Brown, David Paul. Upon being asked to describe Niagara. (*In* Springs, water-falls, sea-bathing resorts, and mountain scenery of the United States and Canada . . . N. Y.: J. Disturnell. 1855. P. 106.) VIII

Brown, J. Newton. The Falls of Niagara. (*In his* Emily, and other poems. Concord: Boyd. 1840. Pp. 126–129.) VIII

(Brown, James Bryce.) Views of Canada and the colonists, embracing the experience of an eight years' residence; views of the present state, progress, and prospects of the colony; with detailed and practical information for intending emigrants. 2d ed. Edinb. A. and C. Black. 1844. Pp. 90–92 V

Brown, James Francis. The red man's fact. [1908?] IX

—— The white man's fancy. [1908?] IX

Brownell, Henry Howard. Niagara. (*In his* Poems. N. Y.: D. Appleton & Co. Phila.: Geo. S. Appleton. 1847. Pp. 38–45.) VIII

Bruce, Dwight H. (ed.) The empire state in three centuries. N. Y.: The century history co. n.d. 2: 297–298.

Bruce, Wallace. Niagara. (*In* Michigan Central R. R. Chicago: 1901. P. 33.) VIII

Brush, Harlan W. Development of Niagara power. (Consular repts., Mar., 1903. V. 71, no. 270, pp. 448–450.) X

—— Electric power at Niagara. (Sci. Am. sup., Jan. 24, 1903. 55: 22633–4.) X

Bryant, Henry G. Extract from *Century magazine* for September, 1892, describing an expedition made to the Grand Falls, Labrador. (Am. rep't of the com'rs of the state reserv. at Niagara. Albany. 1893. 9: 81–83.) V

Buck, Harold W. The new generating plants of the Niagara Falls power company. (Trans., Am. inst. elec. engrs. Great Barrington, Mass. June 18, 1902. 19: 765–780.) X

—— The new generating plants of the Niagara Falls power company. (Eng. news, July 3, 1902. 48: 9–11.) X

—— Niagara Falls from the economic standpoint. (Outl., May 19, 1906. 83: 133–136.) X

—— Niagara Falls power. (Cass., May, 1901. 20: 3–20.) X

—— Recent developments in Niagara power. (Cass., Dec., 1903. 25: 104–115.) X

—— Utilization of Niagara power. (Jour. ass'n eng. soc., June, 1904. 32: 344–351.) X

Buck, L. L. A few remarks about the Niagara gorge, and discussion. (Trans. A. M. S. C. E. Aug., 1894. 32: 205–213.) VII

Buckingham, James Silk. America historical, statistic and descriptive. Lond.: Fisher. (1841.) 2: 498–534 III

—— The eastern and western states of America. Lond. and Paris: Fisher, Son. [1843.] 3: 452–471 III

—— The Falls of Niagara. (British and foreign institute, transactions. Lond.: 1845. 1: 401–403.) III

—— Hymn to Niagara. (*In* Barham, William, Descriptions of Niagara: selected from various travellers; . . . Gravesend: n. d. Pp. 41–42.) VIII

Buckingham, James Silk. Hymn to Niagara. (*In* Johnson, R. L., Niagara, its history, incidents and poetry . . . Wash.: W. Neale. 1898. Pp. 56–57.) VIII

—— The talk of Niagara. (British and foreign institute, transactions. Lond.: 1845. 1:401–403.

Buckingham and Chandos, *Duchess* of A. A. Glimpses of four continents, letter written in 1893. Lond.: Murray. 1894. Pp. 273–275 IV

Büettner, Johann G. Briefe aus und über Nordamerika; oder, Beiträge zu einer richtigen kenntniss der Vereinigten Staaten und ihrer Bewohner . . . Dresden and Leipzig: Arnoldische Buchhandlung. 1847. 1:61–69.....III

Buffalo and Niagara power. no imp. [1895.]

Buffalo (N. Y.) board of trade. . . . Report of the committee to be presented to the commercial convention at Detroit, to be held December 13, 1871, relative to the Niagara ship canal project [Buffalo, 1871.]

Buffalo bridge question (The). [Remonstrance of citizens of Erie and Niagara counties, New York, against the passage of any law authorizing the construction of a bridge across the Niagara river.] (Niagara Falls Gazette extra.)

Buffalo historical society. Annual report of the board of managers, January 12, 1886, and the society proceedings, with an appendix containing a report of the proceedings at Niagara Falls, July 15, 1885, dedicating the New York State Reservation, of "Free Niagara," to the world. Buffalo: 1886.

—— Publications. Vol. XIII. 1909. (See index for references to Niagara ship canal and effect of opening of Erie canal on the Niagara portage.) XII

Buffalo-Niagara power celebration (The). (Elec. eng., Jan. 20, 1897. 23:85–87.)

Buffalo Saengerfest guide and pocket companion; also guide to Niagara Falls. Buffalo: Hahn and Schelle. 1883.....XII

Buffalo: Some representative views collected under the direction of the Buffalo merchants' exchange, for presentation to the delegates of the International American conference as a souvenir of their visit to the city on October 14, 1889.....IX

Bulkley, C. H. A. Niagara. A poem. N. Y.: Leavitt, Trow & Co. 1848. P. 55.....VIII

Bull, Sara C. [Ole Bull's "Niagara"] (*In her* Memoirs of Ole Bull. Bost.: Houghton, Mifflin & Co. 1886. Pp. 169–172.) .VIII

Bullock, W. Sketch of a journey through the western states of North America from New Orleans, by the Mississippi, Ohio, city of Cincinnati and Falls of Niagara, to New York, in 1827. . . . Lond.: John Miller. 1827. Pp. xxiii–xxvi. (Thwaites, Early western travels. 9:142–149.) III

Bunn, Alfred. Old England and New England. Lond.: Bentley. 1853. 1:302–310.....IV

Burbank, George B. The construction of the Niagara tunnel, wheel pit and canal. (Cass. July, 1895. 8:213–224.).....X

Burford, Robert. Description of a view of the Falls of Niagara, now exhibiting at the Panorama, Leicester square, painted by the proprietor, Robert Burford, from drawings taken by him in the autumn of 1832. Lond.: Brettell. 1833.....IX

Burke's descriptive guide; or, The visitor's companion to Niagara Falls: its strange and wonderful localities. By an old resident. Buffalo: Andrew Burke. 1851.....XII

Burk's guide of Niagara Falls: directions as suggested by a resident. Niagara Falls: C. E. Burk. 1904.....XII

Burne-Jones, Philip. Dollars and democracy. With numerous illustrations from original drawings by the author. N. Y.: 1904. Pp. 234–238 XI

Burroughs, *Rev.* Charles. Niagara Falls. (*In his* The poetry of religion and other poems. Bost.: Ticknor, Reed and Fields. 1851. Pp. 62–66, 67–68.).....VIII

Burton act to be extended. (Elec. wld. & eng., Feb. 22, 1913. 61:391.) XI

The Burton bill and its effects on electrical developments at Niagara Falls. (Elec. wld. & eng. June 29, 1907. 49: 1291–1294.).....X and XI

Busch, Moritz. Wanderungen zwischen Hudson und Mississippi, 1851 und 1852. Stuttgart und Tubingen. 1854. 2:121.....IV

Business Men's Association of Niagara Falls. The water-power of Niagara applied to manufacturing purposes: the hydraulic tunnel of the Niagara Falls power company: and accurate description of one of the greatest industrial undertakings of the age. [Buffalo: Matthews, Northrup. 1890 c.].....X

Butler, Frances Anne. Journal. 2 Vols. Phila.: Carey, Lea and Blanchard. 1835. 2:215–218.....XII

Butler, W. F. The great lone land; a narrative of travel and adventure in the north-west of America. Lond.: Low, Marston, Low, Searle. 1872. P. 25 IV

Buttre, J. C. Niagara Falls. (Lit. liv. age, May 27, 1854. 41: 385.) IX

Bye, J——. (sc.) The Falls of Niagara with the adjacent country. 6½ x 14. Lond.: J. Johnson. 1804. (*In* Volney, C. F., View of the climate and soil of the United States. Lond.: for J. Johnson. 1804. Pl. 3. P. 99. *Also* Phila.: Conrad. 1804. P. 80.) .. IX

C. R. (del.) Niagara Falls. (Horseshoe Fall) John Poppel (sc.) Published for Herman J. Meyer. N. Y.: 1851 IX

—— John Poppel. (sc.) Niagara Falls. (Horseshoe Fall) (Grosvenor library, Buffalo, N. Y. Views of Niagara Falls. 1697–187—. Mat 16.) IX

Cable bridge at Niagara replaced by conduit. (W. elec. Aug. 1, 1903. 33: 74.)

Cableway over Niagara's whirlpool. (Lit. dig. May 13, 1916. 52:1365.)

Cabot, J. Elliot. *see* Agassiz, Louis.

Caine, W. S. A trip round the world in 1887–1888. Lond.: Routledge and Sons. 1888. Pp. 27–32 IV

Calcium carbide. (Elec. wld. June 5, 1897. 29: 733–734.) .. X

Calendar of N. Y. col. mss., indorsed land papers; in the office of the secretary of state of N. Y. (1643–1803) Albany: Weed, Parsons & Co. 1864. P. 653. Sept. 7, 1784. 37: 43 V

—— In the office of the secretary of state of N. Y. (1643–1803) Albany: Weed, Parsons & Co. 1864. P. 865. Dec. 1, 1791. 52: 72 V

—— In the office of the secretary of state of N. Y. (1643–1803) Albany: Weed, Parsons & Co. 1864. P. 866. Dec. 12, 1791. 52: 82 V

—— In the office of the secretary of state of N. Y. (1643–1803) Albany: Weed, Parsons & Co. 1864. P. 908. Feb. 4, 1793. 55:121 V

—— In the office of the secretary of state of N. Y. (1643–1803) Albany: Weed, Parsons & Co. 1864. P. 910. Mar. 14, 1793. 55:161 V

Callington, W. R. Birdseye view of the River Niagara from Lake Erie to Lake Ontario; showing the situation and extent of Navy Island and the towns and villages on the banks of the river in Canada and the United States, . . . from an actual survey made in 1837. Bost. . IX

Cameron, P. Calderon. Niagara Falls in winter.

Cameron, Roderick. Catalogue of plants which have been found growing without cultivation in the park and its outlying territories. . . . (Ann. rep'ts of the com'rs for the Queen Victoria Niagara Falls park. 1894. 9:app.) VI

—— Catalogue of plants which have been found growing without cultivation in the park and its outlying territories. . . . (Ann. rep'ts of the com'rs for the Queen Victoria Niagara Falls park. 1895. 10:app.) VI

Campanius Holm, Thomas. [View of the Falls of Niagara.] T. Ch. (sc.) 5¼ x 5¾. (*In his*, Kort beskrifning om provincien Nya Severige uti America, som nu forjden af the Engelske kallas Pennsylvania. Stockholm: S. Wankyfs. 1702. Opp. p. 4.) IX

Campbell, John Francis. A short American tramp in the fall of 1864. Edinb.: Edmonston and Douglas. 1865. Pp. 228–264. VII

Campbell, Patrick. Travels in the interior inhabited parts of North America. In the years 1791 and 1792. . . . Edinb.: Guthrie. 1793. Pp. 174–176. II

Campbell, Thomas. The emigrant. (*In* Descriptive catalogue of the Gluck collection in the Buffalo Public Library. Buffalo, N. Y.: 1899.)

Campuzano, D. Juan Bustamente y. Del Atlantico al Pacifico; Apuntes e Impresiones de un Viaje a traves de los Estados Unidos. Madrid. 1885. Pp. 346–364. IV

Canada — Commission of conservation. Water powers of Canada; by Leo. G. Denis and Arthur V. White. Ottawa: The Mortimer co. 1911. (See index.) X

Canada seventy years ago. 3d ed. St. Catherines, Ont.: 1860. . V

Canadian electrical development at Niagara. (Eng. (Lond.:) Aug. 7, 1903. 96:136–139.) X

Canadian girl, or the Pirate of the lakes (The), a story of the affections; by the authoress of the *Jew's daughter*. Lond.: W. Bennett. 1838. Pp. 264–267. VIII

Canadian guide book (The). . . . Montreal: Armour and Ramsay. 1849. Pp. 1–9. XII

Canadian handbook and tourist's guide (The), giving a description of Canadian lake and river scenery and places of historical interest with the best spots for fishing and shooting. Comp. by H. B. Small, ed. by J. Taylor. Montreal: Longmore and Co. 1866. Pp. 170–184 XII

Canadian-Niagara power. (Elec. wld. & eng., Apr. 11, 1908. 51:756.) XI

Canadian-Niagara power company (The). (Elec. wld. May 27, 1899. 33:707.)

Canadian-Niagara power company's development. (Can. eng. Nov., 1902. 9:290–292.) X

Canadian Niagara power company's transmission to Buffalo. (Elec. wld. & eng., June 29, 1907. 49:1299–1302.) . . .X

Canadian-Niagara power league (The). (Elec. rev. Nov. 24, 1897. 31:251.)

Canadian-Niagara power to-day. (Elec. wld. & eng. Jan. 7, 1905. 45:17–20.)

Canadian power plant (The). (Elec. wld. Jan. 14, 1899. 33:47–49.) X

Canadian tourist (The). . . . Montreal: Hew Ramsay. (cop. 1856.)

Canal board. Proceedings. Report of the canal board on the Niagara ship canal XII

Canale, G. D. To Niagara. (Lit. liv. age, Aug. 28, 1858. 58: 716.) VIII

Cantilever bridge over Niagara. (Knowl. April 4, 1884. 5: 227.) XII

Caparn, Harold A. Present status of Niagara Falls. (Landscape architecture. April, 1914. 4:No. 3, 81.) XI

Captivity and sufferings of Benjamin Gilbert and his family, 1780–83 (The). Reprinted from the original edition of 1784 with introduction and notes by Frank H. Severance. Cleveland. 1904. Pp. 129–130 V

Carborundum company (The). (Elec. wld. June 5, 1897. 29:731–732.)

Carlisle, George William Frederick Howard. Two lectures on the poetry of Pope, and on his own travels in America. Delivered to the Leeds Mechanics' institution and literary society, December 5th and 6th, 1850. Leeds. 1850. Pp. 25–26.....XI

Carpenter, William Lant. The falls of Niagara in winter. (Nature, Mar. 31, 1881. 23:511–514.).....V

Carpio, Manuel. Soneto a la Catarata del Niagara. (*In* Poesias de Manuel Carpio con su biografia escrita por el Sr. Doctor Jose Bernardo Conto. Nuova edicion. Veracruz-Pueblo: Liberias La Ilustracion. Paris: A. Donnametti. 1883. P. 206.).....VIII

Carta della nouva Inghilterra, Nuova York, e Pensilvania. (*In* Atlante dell' America. [anon.] Liverno: Presso Gio Tomasso Masi, e comp. con approvazione. 1777. No. 2.).....IX

Carta rappresentante i cinque Laghi del Canada. (*In* Atlante dell'America. (anon) Liverno: Presso Gio Tomasso Masi, e comp. con approvazione. 1777. No. 5.).....IX

Carte de la nouvelle France, augmentée depuis la derniére seruant a la navigation faicte en son vray Meridien par le S'r. de Champlain, Capitaine pour le Roy en la Marine, le quel depuis, l'an 1603, jusques en l'année 1629; a descouvert plusieurs costes terres; lacs rivieres et Nations de sannoges por cy diuant incognues comme il se voit en ses relations qui'l a faict. Imprimer en 1632. (*In* O'Callaghan, E. B. Documentary history of the state of New York. Albany: 1849. 3: Frontispiece P. 13.)

Carte pour suivre la relation des voyages de cavalier de La Salle, 1669–1682. 7 x 6½. (*In* Société de géographie. Bulletin. 6 serie. Paris: 1880. 20: At end.).....IX

Carter, James C. Oration at the dedication of the state reservation at Niagara, July 15, 1885. (19th ann. rep't of the com'rs of the state reserv. at Niagara.) Albany: 1903. Pp. 263–277.).....XI

Carus, Paul. The chief's daughter: a legend of Niagara. Chicago: 1901 c.....VIII

Carus-Wilson, Charles A. The Niagara spray clouds. (Nature. March 2, 1893. 47:414.)

Carver, Jonathan, captain. Travels through the interior parts of North America, in the years 1766, 1767, and 1768. Lond.: J. Walter. 1778. Pp. 169–170.....II

[Cass, Lewis.] France, its king, court and government. By an American. N. Y.: Wiley and Putnam. 1840. Pp. 127–130.....II

Cassier's magazine. Niagara power number. July, 1895. 8:173–384.....X

Cataract of Niagara (The). (1702) (Print.).....IX

Cataract house, Niagara Falls. (Grosvenor library, Buffalo, N. Y. Views of Niagara Falls. 1697–187—. Mat 17.).....IX

Cataract House, Niagara Falls. (Grosvenor library, Buffalo, N. Y. Views of Niagara Falls. 1697–187—. Mat 17.) IX

Cataract power company's transmission plant (The). (Elec. wld. July 2, 1898. 32: 3–4.)

Cazin, F. M. F. Niagara power. (Elec. wld., July 17, 1897. 30: 72–74.) X

Central station campaign at Niagara Falls (A). (Elec. wld. & eng. Nov. 16, 1905. 46: 863.)

Chamberlin, John. [Letter to editor by John Chamberlin of Buffalo on "The Niagara Reservation" and its remarkable and various plant life.] (Garden and forest, Nov. 30, 1892. 5: 575.) VI

Chambers, William. Things as they are in America. Lond. and Edin.: William and Robert Chambers. 1854. Pp. 102–112. . . .XI

Champlain, Samuel de. Champlain map, 1632. (*In* Oeuvres de Champlain publiées sons le patronage de L'Université Laval par L'Abbé C.—H. Laverdière. 2d ed. Quebec: 1870. 2: opp. 1385.) . .IX

—— Des Savvages, ov, Voyage de Samvel Champlain de Brovage, fait en la France Novvelle, l'an mil six cens trois: contenant les moeurs, façon de viure, mariages, guerres, & habitation des sauuages de Canadas . . . A Paris, Chez Clavde de Monstr'œil. [1604.] Pp. 42, 45–46, 47. (Œuvres de Champlain, publiées sous le patronage de l'Université Laval par l'abbé C.-H. Laverdière. Quebec: Imprimé au Séminaire par G.-E. Desbarats. 1870. 1: 106, 109–110, 111.) I

—— Voyages. Translated from the French by Charles Pomeroy Otis. With historical illustrations, and a memoir by the Rev. Edmund Farwell Slafter. Boston: Prince Society. 1878–1882. 1: 271, 274–276. .I

Chandler, Henry. The nymph of Niagara gorge. Buffalo: 1890 VIII

Changes in the Buffalo-Niagara Falls power transmission line. (St. ry. jour., Dec., 1897. 13: 860.)

Channing, William Ellery. The Niagara Fall. (*In his* Poems. Bost.: Little and Brown. 1843. P. 35.) VIII

Channing, William H. Niagara. (*In his* Leaves of spring gathered in autumn. [Poems] Phila.: Press of J. B. Lippincott and Co. 1883. Pp. 66–79.)

Chapin, J. R. Niagara Falls and how to see them. Buffalo: (1874) XII

Chapter on Niagara (A). (Am. month. mag. June, 1838. 11 (n.s.5): 529–535.) III

Charles, Emily Thornton. An address to the body of a man in the whirlpool. Niagara. (*In her* Lyrical poems. Phila.: Lippincott. 1887. Pp. 110–111.) VIII

Charlevoix, Pierre François Xavier de. Histoire et description generale de la Nouvelle France, avec le Journal Historique d'un voyage fait par ordre du roi dans l'Amerique Septentrionale. Paris: Chez la Veuve Ganeau. 1744. 5: 335–336, 343–347 I

—— Journal of a Voyage to North-America. Undertaken by order of the French King. Containing the geographical description and natural history of that country, particularly Canada . . . In a series of letters to the Duchess of Lesdiguières. Translated from the French. London: R. and J. Dodsley. 1761. 1:345–356 I

Chateaubriand, François Auguste René, *vicomte de.* Atala; ou, Les amours de deux sauvages dans le désert. Paris: Impr. de Migneret, an IX — 1801 VIII

—— Atala; or, The amours of two Indians in the wilds of America. Lond.: For J. Lee. 1802. Pp. 120–121 VIII

—— Travels in America and Italy. Lond.: Colburn. 1828. 1:131–134 II

Chatelain, H. A. Carte contenant le royaume du Mexique et la Floride, dressée sur les meilleures observations et sur les memoires les plus Nouveaux. (*In his* Atlas historique [anon.] fol. Amsterdam: 1705–20. V. 6, No. 27:101.) IX

—— Carte de la Nouvelle France où se voit le cours des grandes rivière de S. Laurens et de Mississipi, aujourd'hui S. Louis. (*In his* Atlas historique. [anon.] fol. Amsterdam: 1705–20. V. 6, No. 23:91.) IX

—— Carte du Canada ou de la Nouvelle France, & des découvertes qui y ont été faites. (*In his* Atlas historique. [anon.] fol. Amsterdam: 1705–20. V. 6, No. 20:82.) IX

—— Carte très-curieuse de la Mer du Sud, contenant des remarques nouvelles & très-utiles non seulement sur les ports & iles de cette mer, mais aussi sur les principaux pais de l'Amérique tant Septentrionale que Méridionale . . . (*In his* Atlas historique. [anon.] fol. Amsterdam: 1705–20. V. 6, No. 30:117.) IX

—— Saut ou chute d'eau de Niagara. 4½ x 5. (*In his* Atlas historique. [anon.] fol. Amsterdam: 1705–20. V. 6, No. 24: 94.) IX

Cheap electricity for all. (Conservation commission of the state of New York.) n.d. X

Chemical plant at Niagara (A). (Jour. soc. chem. ind., Jan. 30, 1897. 16: 73.)

Chester, Greville John. Transatlantic sketches in the West Indies, South America, Canada and the United States. Lond.: Smith, Elder. 1869. Pp. 279–282 IV

Chisholm, Hugh J. Niagara. Chisholm's complete guide to the grand cataract. [Portland, Me.: Chisholm Bros. 1891.] Bound with: New album of Niagara Falls. N. Y. [Portland, Me.: 1891?]

Christmas, H. Canada in 1849. Pictures of Canadian life; or, The emigrant churchman. By a pioneer of the wilderness. Edited by the Rev. H. Christmas. Lond.: Richard Bentley. 1850. 1:131–167 IV

Church, Frederick Edward. Niagara. 1857 IX

—— The great fall, Niagara. Painted by Frederick Edward Church. N. Y.: Williams, Stevens, Williams and Co. 1857 IX

[Church's Niagara.] (Lit. liv. age, Oct. 24, 1857. 55: 254–255.) IX

Church's new picture of Niagara (Mr.). (Lit. liv. age, May 15, 1868. 97: 441–443.) IX

Clark, George L. Niagara Falls power, different types of development. (Cass., May, 1905. 28: 79–81.) X

Clark, John. Memoirs of Colonel John Clark, of Port Dalhousie, C. W. (Ontario hist. soc. Papers and records. 7:173–175.) .. XII

Clark, Lewis Gaylord, *editor*. The literary remains of the late Willis Gaylord Clark, including the Ollapodiana Papers, the Spirit of Life, and a selection from his various prose and poetical writings. N. Y.: Burgess, Stringer and Co. 1844. Pp. 154–172 III

Clark, Willis Gaylord. (Poem.) (*In* Holley, George W., Niagara; its history and geology, incidents and poetry . . . N. Y., Buffalo, Toronto. 1872. Pp. 161–162.) VIII

Clarke, John M. The menace to Niagara. (Pop. sci. mo., Apr., 1905. 66:489–504.) XI

—— A scientist's view of Niagara. (Harp. w., Nov. 21, 1903. 47: pt. 2: 1866.) VII

Claypole, E. W. The eccentricity theory of glacial cold versus the facts. (Trans. Edin. Geol. Soc. 1888. 5:534–548.) VII

Claypole, E. W. Falls of rock at Niagara. (Nature. Feb. 14, 1889. 39: 367.) VII

—— The old gorge at Niagara. (Science n.s. Aug. 13, 1886. 8: 236.) VII

Clifton house, Niagara Falls. (Grosvenor library, Buffalo, N. Y. Views of Niagara Falls. 1697–187–. Mat. 17.).....IX

Clifton suspension bridge at Niagara Falls (The). . . . Niagara Falls, N. Y.: Brundage. 1872.....XII

Clinch, *Rev.* Joseph H. Niagara. (*In his* The captivity in Babylon, and other poems. Bost.: Burns. 1840. Pp. 77–81.).....VIII

Clinton, DeWitt. The life and writings of DeWitt Clinton by William W. Campbell. (N. Y.: Baker and Scribner. 1849. Pp. 130–131.) VI

Clinton, George W. Journal of a tour from Albany to Lake Erie by the Erie canal in 1826. (Pub. Buf. Hist. Soc. 14:292–293.)...VI

—— Sketches of Niagara Falls and river by Cousin George. Buffalo: Peck. 1846.....V and VIII

Cockburn, *Lieut.-Col.* James Patterson, R. A. Chute du Niagara *and* Entrance to the cave of the Horseshoe, Niagara, on the English side. (Grosvenor library, Buffalo, N. Y. Views of Niagara Falls. 1697–187–. Mat 12.).....IX

—— Falls of Niagara. Lond.: Ackermann & Co. 1833.....IX

—— The Falls of Niagara. Engraved by C. Hunt. Lond.: Ackermann & Co. 1857.....IX

Coe, Ben F. Evolution of Niagara power. (Coll. w. May 28, 1896. Pp. 11–12.) X

Coke, E. T. A subaltern's furlough: descriptive of scenes in various parts of the United States, upper and lower Canada, New Brunswick, and Nova Scotia, during the summer and autumn of 1832. Lond.: Saunders and Otley. 1833. Pp. 292–311.....XI

Cole, Thomas. A distant view of the Falls of Niagara. From an original picture in the possession of Joshua Bates, Esq. Painted by T. Cole, Esq. Engraved and printed by Fenner Sears & Co. 4½ x 5½. Lond.: I. T. Hinton and Simpkin & Marshall, 1831. (*In* Hinton, J. H. ed., History and topography of the United States. 3d ed. Lond.: J. Dowding. 1842. 2: opp. 484.).....IX

—— A distant view of the Falls of Niagara. Painted by T. Cole. Engraved on steel by T. S. Woodcock. 5½ x 7¾. Bost.: S. Walker. 1832. (*In* Malte-Brun, Conrad, A system of universal geography. Bost.: S. Walker. 1834. 2:199.).....IX

Cole, Thomas. The Falls of Niagara. (Twenty years ago.) 3¾ x 6. (*In* Our globe; a universal picturesque album, ed. by the North American bibliographic institution. Phila.: 1840. 1:9.).....IX

—— A distant view of the Falls of Niagara. From an original picture in the possession of Joshua Bates, Esq., painted by T. Cole, Esq. Lond.: Pub. April 1, 1831, by I. T. Hinton and Simpkin & Marshall. (Grosvenor library. Buffalo, N. Y. Views of Niagara Falls. 1697–187–. Mat 9.).....IX

—— A distant view of the Falls of Niagara, painted by T. Cole, Esq., engraved on steel by T. S. Woodcock. Boston: pub. by S. Walker, 1832. (Grosvenor library, Buffalo, N. Y. Views of Niagara Falls. 1697–187–. Mat 9.).....IX

Coles, Abraham. Niagara. (*In his* The microcosm, and other poems. N. Y.: Appleton. 1881. Pp. 219–222.).....VIII

—— A Sabbath at Niagara. (*In his* The microcosm and other poems. N. Y.: D. Appleton and Co. 1881. Pp. 226–235.).....VIII

Colt, *Mrs.* S. S. *ed.* The tourist's guide through the empire state. Albany. 1871. Pp. 188–196.

Colton, C. Tour of the American lakes, and among the Indians of the North-west territory, in 1830 . . . Lond.: Westley, Davis. 1833. 1:1–11 III

Combe, George. Notes on the United States of North America during a phrenological visit in 1838–9–40. Phila.: Cary and Hart. 1841. 2:79–80 III

Comettant, Jean Pierre Oscar. Voyage pittoresque et ancedotique dans le Nord et le Sud des Etats-Unis d'Amerique. Paris. 1866. Pp. 146–170.....IV

Commelia, Anna Olcott. Niagara. (*In her* Of such is the kingdom, and other poems. N. Y.: Fowler and Wells. 1894. Pp. 17–20.) VIII

Complete illustrated guide to Niagara Falls and vicinity (The). Gazette printing house. Niagara Falls: (1883).

Comstock, John Lee. Outlines of geology. Hartford: D. F. Robinson. 1834. Pp. 30–36.....VII

Conclusions of the Niagara power companies regarding Niagara (The). (Elec. rev. Mar. 25, 1905. 46:494.).....X

Continued protection of Niagara (The). (Outl., Feb. 6, 1909. 91:274–275.) XI

Constitutional convention. Report of the subcommittee on proposed constitutional amendment. (Ann. rep'ts of the com'rs of the state reserv. at Niagara. 1904. 21:149–167.).....XI

Construction of the Niagara Falls hydraulic plant. I. (Eng. rec., Jan. 14, 1893. 27:132–136.).....X

—— II. (Eng. rec., Mar. 11, 1893. 27: 293–294.).....X

—— III. (Eng. rec., Apr. 22, 1893. 27: 415–416.).....X

—— IV. (Eng. rec., May 20, 1893. 27: 490–491.).....X

—— V. (Eng. rec. July 8, 1893. 28:87–88.).....X

—— VI. (Eng. rec., Aug. 19, 1893. 28:183–184.).....X

—— VII. (Eng. rec., Sept. 30, 1893. 28: 280–281.).....X

—— VIII. (Eng. rec., Oct. 21, 1893. 28: 328–329.).....X

—— IX. (Eng. rec., Nov. 4, 1893. 28: 360.).....X

Control and regulation of Niagara river. (Elec. wld. & eng., Feb. 1, 1913. 61:235.).....XI

Control of navigable streams (The). (Elec. wld. & eng., Feb. 15, 1913. 61:329.).....XI

Cook, Joel. Niagara. (*In his* America, picturesque and descriptive. Phila.: Coates. 1900. Vol. II. Pp. 379–386).

Cook, Joseph. Overtones; a book of verse. N. Y.: Knickerbocker press. 1903. Pp. 85–86.....VIII

Cooke, Henry. An excursion to Niagara and Canada. (Colburn's new monthly mag. 1849. 87: 358–360.).....IV

Cooper, James Fenimore. The oak openings; or The bee-hunter . . . N. Y.: Burgess, Stringer. 1848. 2:216–217.....VIII

—— The pathfinder; or The inland sea . . . Phila.: Lea and Blanchard. 1840. 1: 47–49. 2: 52–53.....VIII

—— The spy; a tale of the neutral ground . . . Lond.: H. Colburn and R. Bentley. 1831. P. 403.....VIII

Copeland, Benjamin. Niagara and other poems. Buffalo: Matthews-Northrup. 1904. Pp. 11–12.....VIII

Cornish, Vaughan. The travels of Ellen Cornish; being the memoir of a pilgrim of science, with sixty-five plates from photographs by the author, maps and plans. Lond.: W. J. Ham-Smith. 1913. Pp. 105–138.....VII

Cornwallis, Kinahan. Royalty in the New World; or The Prince of Wales in America. New York: Doolady. 1860. Pp. 145–153.....IV

Coronelli, [M. V.]. L'Amérique Septentrionale, ou la Partie Septentrionale des Indes occidentales. Dressée sur les Nouveaux Corrigée et augmentée Par le Sr. Tillemon; et Dediée a son Excellence Monsiegneur Pierre Venier, ambassadeur ordinaire de la Serenissime Republique de Venise, pres di sa Majesté tres Christienne Louis le Grand. Par le P. Coronelli, Cosmographe de la Ser'me Republique de Venise. À Paris: Chez J. B. Nolin sur le Quay de l'Horloge des Palais, Vers le Pont Neuf, a l'Enseigne de la Place des Victoires. Avec Privilege du Roy. 1689 IX

—— La Louisiana, parte settrionalle scoperta sotto la protettione de Luigi XIV, Ré di Francia. Dal. Coronelli. (Atlante Veneto. Venice: 1695. I:28.) IX

—— Partie occidentale du Canada ou de la Nouvelle France ou sont les nations des Ilinois, de Tracy, les Iroquois, et plusieurs autres peuples; avec la Louisiane nouvellement découverte . . . Dressée sur les Memoires les plus Nouveaux Par le P. Coronelli Cosmographe de la Ser'me Republique de Venise. Corrigée et augmentée Par le S'r. Tillemon; et Dediée a Monsieur l'Abbé Baudrand. A Paris. Chez J. B. Nolin sur le Quay de l'Horloge de Palais Vers le Pont Neuf a l'Enseigne de la Place des Victoires. Avec Privilege du Roy. 1688 IX

—— Partie orientale du Canada ou de la Nouvelle France ou sont les Provinces, ou Pays de Saguenay, Canada, Acadie . . . Les Peuples, au Nations des Etechemins, Iroquois, Attiquomeches . . . avec la Nouvelle Angleterre, la Nouvelle Ecosse, la Nouvelle York, et la Virginie, les Isles de Terre Neuve, de Cap Breton . . . Dressée sur les Memoires les plus Nouveaux Par le P. Coronelli cosmographe de la Serenis'me Republique de Venise. Corrigée et augmentée par le S. Tillemon; et Dediée a Monsieur l'Abbé Baudrand par son tres humble Serviteur J. B. Nolin. A Paris. Chez J. B. Nolin. 1689.....IX

Cortambert, Louis Richard. "Excursion aux cataractes du Niagara. Juin, 1833." (*In his* Voyage au pays des Osages. Un tour en Sicile. Paris: A. Bertrand. 1837. Pp. 85–90.).....III

Cost of Niagara. (Lit. dig., Sept. 23, 1916. 53:742.)

Cost of power at Niagara (The). (Jour. Frank. inst., June, 1895. 139:477–478.)

Cousin George. Sketches of Niagara Falls and river. Buffalo: Wm. B. and Chas. E. Peck. 1846.....XII

Cowdin, Jasper Barnett. Ripple brook, Niagara Falls; two poems. Brooklyn, N. Y.: 1886. P. 7.....VIII

Coyle, William H. Falls of Niagara, as seen from the Table rock. October, 1834. A poem . . . Jacksonville: Calvin Goudy, Ptr., 1835.

Cox, F. A. *and* Hoby, J. The Baptists in America; a narrative of the deputation from the Baptist Union in England, to the United States and Canada. N. Y.: Leavitt, Lord. 1836. Pp. 207–209....III

Coxe, Reginald. The Luna Fall.....IX

—— Study of the rapids.....IX

Craig, W. M. (del.) Falls of Niagara; on the river St. Lawrence in Canada. T. Wallis. (sc.) Published as the act directs by C. Brightly *and* T. Kinnersley, Bungay; Nov., 1804.....IX

Cramer, Charles. Etwas über die Natur Wunder in Nord America. Zweiter Alschnitt. St. Petersburg: Gretsch. 1840. Pp. 6–9....V

Cranch, Christopher Pearse. The cataract isle. (*In* Johnson, R. L., Niagara; its history, incidents, and poetry. . . . Wash.: W. Neale. 1898. Pp. 49–50.).....VIII

Creation and development of the state reservation at Niagara (The). (Ann. rep'ts of the com'rs of the state reserv: at Niagara. 1902. 19:14–84.).....XI

Creuxius Franciscus (S. J.). New France in 1660. (Reduced facsimile *from his* "Historia Canadensis." Paris: 1664.).....IX

—— New France in 1660. (Reduced facsimile from his Historia Canadensis. Paris: 1664.) (*In* Thwaites, R. G., Jesuit relations. Cleveland: Burrows Bros. 1900. 46: frontispiece.).....IX

Crévecouer, Hector St. John de. Description of Niagara Falls in a letter to his son under date of July, 1785. (Mag. Am. hist., Oct., 1878. Vol. II, pt. II, pp. 605–613.).....II and IX

[Crévecouer, Hector St. John de.] Voyage dans la haute Pensylvanie et dans l'état de New York, par un membre adoptif de la nation Oneida. Traduit et publié par l'auteur d'un cultivateur American. Paris: De Crapelet. 1801. 2:148–193.....II

Crowley, *Mrs.* Richard. Echoes from Niagara: historical, political, personal. Buffalo: Moulton. 1890. Pp. 1–19.....V

Cruikshank, Julia. Whirlpool heights: the dream-house on the Niagara river. Lond.: George Allen & Unwin, Ltd. 1915....VIII

Cumberland, Barlow. A century of sail and steam on the Niagara river. Toronto: 1913. Pp. 31–32; 99–101; 121; 169.....XII

Currie, P. W. On the ancient drainage at Niagara Falls. (Geog. jour., Dec., 1901. 18:642.).....VII

Currie, P. W. On the ancient drainage of Niagara Falls. (Trans. of the Can. inst. Aug., 1901. 7: pt. 1. No. 13:7–14.).....VII

Currier, N. ——. Niagara Falls from Table Rock. (Grosvenor library, Buffalo, N. Y. Views of Niagara Falls. 1697–187—. Mat 21.).....IX

Curtis, George William. Lotus-eating. A summer book. N. Y.: Harper Bros. 1852. Pp. 75–102.....IV

Cutter, Charles. Pan-American, Buffalo and Niagara Falls: a picturesque souvenir. 1901 c.....XII

Cutter and Koonz. Panoramic views of Niagara Falls. Niagara Falls: Cutter and Koonz. 1901.....IX

Cutter, G. W. Morning at the Falls. (*In his* Poems and fugitive pieces. Cincinnati: Moore, Wilstach, Keys. 1857. Pp. 266–268.).....VIII

—— Niagara. (*In his* Poems and fugitive pieces. Cincinnati: Moore, Wilstach, Keys. 1857. Pp. 180–183.).....VIII

Cutter's guide to Niagara Falls, and adjacent points of interest. Cutter's guide publishing co. 1897.....XII

Cutting, H. S. The Erie canal vs. the Niagara ship canal. Argument of Hon. H. S. Cutting before the assembly committee on commerce and navigation, March 6, 1866.....XII

D. W. The glory of Niagara. (Life and health, Aug., 1897. Pp. 264–266.).....IV and XI

Dale Stephen M. Seeing Niagara Falls for the first time. Ladies' home jour. June, 1904. 21: 9–10.).....XI

Dalton, Willam. Travels in the United States of America and part of Upper Canada. . . . Appleby. (Eng.): R. Bateman. 1821.....III

Dana, Charles A. Niagara Falls. (General view from Clifton house.) 4 x 6. (*In* Dana, C. A. ed., The United States illustrated. 2 vol. in one. N. Y.: J. Meyer. [1853] 1:13.).....IX

Darby, ——. The straits of Niagara, from a map by Mr. Darby. 6½ x 1½. (*In* Blane, W. N., Travels through the United States and Canada. Lond.: Baldwin & Co. 1828. Opp. p. 404.)...IX

Darby, William. Brooke's universal gazetteer, or new geographical dictionary: , . . 3d Am. ed. Phil.: Bennett and Walton. 1820. P. 553.....V

—— The straits of Niagara. 6½ x 13. (*In his* A tour from the city of New York to Detroit in the Michigan territory. N. Y.: For the author. 1819. Opp. p. 155.).....IX

Darby, William. A tour from the city of New York, to Detroit, in the Michigan territory, made between the 2d of May and the 22d of September, 1818 . . . The tour is accompanied with a map upon which the route will be designated; a particular map of the Falls and river of Niagara, and the environs of the city of Detroit. N. Y.: Kirk and Mercein. 1819. Pp. 160–169.

—— View of the United States, historical, geographical, and statistical; exhibiting, in a convenient form, the natural and artificial features of the several states. . . . Phila.: Tanner. 1828. Pp. 209–216. V

Darton, Nelson Horatio. Catalogue and index of contributions to North American geology, 1732–1891. (U. S. geol. survey. Bull. No. 127. Wash.: 1896. Pp. 686–702.)

Data on electric baking with Niagara power. (Elec. wld. & eng. Aug. 12, 1905. 46: 268.)

Daubeny, Charles Giles Bridle. Journal of a tour through the United States and Canada, made during the years 1837–1838. Oxford: T. Combe, ptr. 1843. Pp. 44–48 . . . . . VII and XI

Davenport, *Bishop*. A new gazetteer, or geographical dictionary, of North America and the West Indies. . . . Balt.: M'Dowell. 1833. P. 356 V

Davies, Thomas. An east view of the great cataract of Niagara. Engraved on copper by J. Foregeron. 1760 IX

Davis, *Major* Henry. "Great Horseshoe Fall." (1848?) . . IX

Davis, Rebecca Harding. The passing of Niagara. (Indep. Nov. 25, 1897. 49: 1527–1528.) XI

Davison, G. M. Niagara Falls: the travelers' guide through the middle and northern states and the provinces of Canada. Saratoga Springs. 1833. Pp. 264–272 XII

Day at the Falls (A). (Colburn's new mo. mag., 1838. 4: 482–483.) III

Day, David F. A catalogue of the flowering and fern-like plants growing without cultivation in the vicinity of the Falls of Niagara. (Ann. rep'ts of the com'rs of the state reserv. at Niagara. 1898. 14: 61–134.) VI

—— Catalogue of the Niagara flora. A catalogue of the flowering and fern-like plants growing without cultivation in the vicinity of the Falls of Niagara. (Ann. rep'ts of the com'rs of the state reserv. at Niagara. 1887. 4: 67–133.) VI

Day, David F. Catalogue of the Niagara flora. A catalogue of the flowering and fern-like plants growing without cultivation in the vicinity of the Falls of Niagara. (Troy:) The Troy Press. 1888.....VI

—— The flora and fauna of Niagara Falls. (The Niagara book. N. Y.: 1901. Pp. 158–177.).....VI

—— The plants of Buffalo and its vicinity. Cryptogamae. (Bull. of the Buf. Soc. of Nat. Sci. 1882. 4:No. 4, 153–290.)....VI

—— The plants of Buffalo and its vicinity. Phaenogamae. (Bull. of the Buf. Soc. of Nat. Sci. 1882. 4:No. 3, 65–152.).....VI

Day, Richard E. Niagara. (*In his* Lines in the sand. [Poems] Syracuse, N. Y.: John T. Roberts. 1878. Pp. 28–30.).....VIII

Day, Samuel Phillips. English America; or, Pictures of Canadian places and people. Lond.: T. Cautley Newby. 1864. 2:211–219 IV

—— Life and society in America. Lond.: Newman. 1880. 2d ser. Pp. 26–46.....IV

Day, W——. (Lith.) Great Horseshoe Fall. On stone by A. Picken, Jr. IX

De berugte waterval van Niagara in New York. (Grosvenor library, Buffalo, N. Y. Views of Niagara Falls. 1697–187—. Mat 2.) IX

Dearborn, Henry A. S. Memorandum of a journey to the Niagara frontier for the purpose of negotiating treaties with the Seneca & Tuscarora tribes of Indians. (Buf. Hist. Soc., pub., vol. VII. See index.) V

—— Death of Washington, with Niagara as a background.

Deedes, Henry. Sketches of the south and west; or, Ten months' residence in the United States. Edinb. and Lond.: 1866. Pp. 8–11.IV

De Haas, Mauritz Frederick Hans. The rapids above the Falls. (1878) IX

Delano, F. R. The water power of Niagara. N. Y.: Banker's pub. assn. 1881. P. 4.....XII

Delarochette, L——. Bowle's new pocket map of North America, divided into its provinces, colonies, etc., by J. Palairet, lately revised and improved with many additions, from D'Anville, Mitchel, and Bellini, by L. Delarochette. Lond.: N. d.....IX

De l'Isle, Guillaume. Carte de la Louisiane et du cours du Mississipi. Dressée sur un grand nombre de mémoires entrau'tres sur ceux de mr le Maire. Par Guillaume De'lisle de l'Académie des Sciences. [1718] IX

De l'Isle, Guillaume. Carte de la Louisiane et du cours du Mississippi dressée sur un grand nombre de Memoires entr' autres sur ceux de M'r. le Maire. Par Guillaume De l'Isle de l'Academie R'le des Science. (*In his* Atlas nouveau. Amsterdam: n. d. Chez Jean Covens et Corneille Morteir. No. 98.) IX

—— Carte de la Louisiane et du cours du Mississippi. (Grosvenor library, Buffalo, N. Y. Maps historical and miscellaneous. No. 80.) IX

—— Carte du Canada ou de la Nouvelle France et des Decouvertes qui y ont été faites dressée sur plusieurs Observations at sur un grand nombre de Relations imprimées ou manuscrites. Par Guillaume De l'Isle de l'Academie Royale des Sciences et Premier Geographe du Roy. A Paris: 1703.....IX

—— Carte du Canada ou de la Nouvelle France et des découvertes qui y ont été faites. A Paris: 1703. (Maps of Am. 1:No. 10.)—IX

—— Carte du Mexique et de la Floride, des terres Angloises et des isles Antilles, du course et des environs de la rivière de Mississipi. Dressé sur un grand nombre de mémoires, principalmt. sur ceux de mr d'Iberville et Le Seur. Per Guillaume Del'Isle. Geographe de l'Academie Royale des Sciences. A Paris: Chez l'Auteur. 1703.IX

—— Carte du Mexique et de la Floride, des terres Angloises et des isles Antilles, au course et des environs de la rivière de Mississipi. Paris: Chez l'Auteur. 1703. (Maps of Am. 1: No. 8.).....IX

—— Carta geografica del Canada nell'America Settentrionale. (Atlante Novissimo Del Sig'r Guglielmo de L'Isle. Venezia: Giambatista Albrizzi I. Girol. 1740. [1740–1750] Vol. I–II [No. 40]).IX

—— Nouvelle Carte particuliére de l'Amerique, ou sont exactment marquées une partie de la Baye d'Hudson, le pays des Kilistinons, la Source de la grande rivière de Mississippi, le pays des Illinois. . . . (*In his* Atlas nouveau. Amsterdam: n. d. Chez Jean Covens et Corneille Mortier. No. 92.).....IX

—— Tabula geographica Mexicae et Floridae. . . . Carte du Mexique et de la Florida. Dated 1722 . . . (*In his* Atlas nouveau. Amsterdam: n. d. Chez Jean Covens et Corneille Mortier. P. 99.) IX

—— [View of Niagara Falls in the early part of the 18th century.] (*In his* Atlas nouveau. Amsterdam: n. d. Chez Jean Covens et Corneille Mortier. P. 96a.).....IX

Delivery and distribution of Niagara power in Buffalo (The). (Elec. wld. Jan. 21, 1899. 33: 76–82.)

Dember, George. Map of Niagara river or the straits between the lakes Erie and Ontario, by Geo. Dember, 60th Reg'mt. (*In* O'Callaghan, E. B., The documentary history of the state of New York. Albany: 1849. 2:458.) IX

Deming, A——. Falls of Niagara in Canada. Engraved by Scott for the Gallery of nature and art. 1802 IX

Der Niagara Fall. (Grosvenor library, Buffalo, N. Y. Views of Niagara Falls. 1697–187—. Mat. 25.) IX

Der Niagara fluss. Verlag d.Englishen Kunstanstalt v. A. H. Payne. Leipzig *and* Dresden IX

De Roos, F. F. American Falls of Niagara. Printed by C. Hullmandel. (1827.)

De Roos, F. F. (delt.) American Falls of Niagara. (Grosvenor library, Buffalo, N. Y. Views of Niagara Falls. 1697–187—. Mat 10.) IX

—— The crescent seen from below the circular ladder. Printed by C. Hullmandel. (1827) (Grosvenor library, Buffalo, N. Y. Views of Niagara Falls. 1697–187—. Mat 10.) IX

—— River Niagara. Cloud of the Falls. (Grosvenor library, Buffalo, N. Y. Views of Niagara Falls. 1697–187—. Mat 10.) IX

De Roos, John Frederick Fitzgerald. Personal narrative of travels in the United States and Canada in 1826. Lond.: W. H. Ainsworth. 1827. Pp. 151–172 III

Desecration of Niagara. (Ladies' home jour. June, 1906. 23:27.) XI

Descent into the rapids of Niagara. An authentic narrative. (Knicker. [N. Y.], Oct., 1851. 38:414–416.) VIII

Description of a view of the Falls of Niagara. . . . Boston: Perkins & Marvin, ptrs., 1837.

Descriptions of the Falls of Niagara. (Mag. of Am. hist., July, 1880. 5:47–56.)

Desor, E. The falls of Niagara and their retrograde movement . . . tr. by J. D. Meredith. (Pottsville scientific association. Pottsville, Penn.: Bulletin, Jan. & Feb., 1855. Pp. 5–10.) VII

—— (Ueber Niagara Falls.) (Geologische gesellschaft. Seitschrift. Sept., 1853. Ed. 5. Pp. 643–644.) [Abstract] VII

Destruction of Niagara (The). (Spec., June 30, 1883. 56:831–832.) XI

Destruction of Niagara Falls (The). (Metal. & chem. eng. Dec., 1912. 10:770.) XI

Destruction of Niagara Falls (The). (R. of R., Apr., 1905, 31:490.) XI

De Tivoli, J. A guide to the Falls of Niagara, with a splendid lithographic view by A. Vaudricourt from a daguerreotype of J. Langheim. N. Y.: Burgess, Stringer and Co. 1846.....XII

Detmers, Arthur. The Devil's hole massacre. (The Niagara frontier landmarks ass'n. Buffalo. 1906. Pp. 47–52.).....V

Detroit (Mich.) board of trade. Niagara ship canal. The necessities of the great west require a depth of not less than fourteen or fifteen feet. An unanswerable argument on the subject. [Detroit, 1866.]

Deuther, Charles George. Canticles of Niagara, and other poems. [Buffalo: 1909.] VIII

De Veaux, Samuel. The Falls of Niagara, or tourist's guide to this wonder of nature, including notices of the whirlpool, islands, etc., and a complete guide through the Canadas. Buffalo: William B. Hayden. 1839 XII

—— Map of Niagara Falls and guide table. 12 x 16. (*In his* The traveller's own book, to Saratoga Springs, Niagara Falls and Canada. . . . Buffalo: Faxon & Read. 1841.).....IX

—— The travellers' own book, to Saratoga Springs, Niagara Falls and Canada, containing routes, distances; . . . Buffalo: Faxon and Read. 1841. Pp. 95–258.....XII

Development of electric power at Niagara Falls (The). (Nature, Apr. 7, 1910. 83:173–176.).....X

Development of Niagara Falls power on the Canadian side (The). (Elec. rev. May 12, 1897. 30:223.)

Devoy, John, *comp.* A history of the city of Buffalo and Niagara Falls . . . Buffalo: 1896.....V

Dewart, Edward Hartley. Songs of life; a collection of poems. Toronto: Dudley and Burns. 1869. Pp. 79–82.....VIII

De waterval van Niagara. (Grosvenor library, Buffalo, N. Y. Views of Niagara Falls. 1697–187—. Mat 3.).....IX

DeWeese, Truman A. How Niagara is "harnessed." (R. of R., July, 1905. 32:58–64.).....X

Dewey, Mary E., *editor.* Life and letters of Catharine Sedgwick. N. Y.: Harper. 1871. Pp. 130–132.....III

Dexter, Charles. Niagara. (*In his* In memoriam versions and idle measures. Cincinnati: Robert Clarke & Co. 1891. P. 186–191.) VIII

Dickens, Charles. American notes for general circulation. Lond.: Chapman and Hall. 1842. 2:176–180.....IV

Die Schnellen des Niagara. (Grosvenor library, Buffalo, N. Y. Views of Niagara Falls. 1697–187—. Mat 22.) IX

Dilke, Charles Wentworth. Greater Britain. A record of travel in English-speaking countries during 1866–7. Phila.: Lippincott. 1869. 1: 69 IV

Discharge of the Niagara river (The). (Eng. mag. April, 1900. 19:129–130.) XI

Distant electric power transmission. (Eng. mag., July, 1900. 19: 586–587.)

Distribution of Niagara energy in Auburn. (Elec. wld., May 2, 1908. 51: 899–902.)

Distribution of Niagara power at Buffalo. (W. elec. June 27, 1896. 18: 320.)

Disturnell, J. *comp.* (A trip through the lakes of North America. N. Y.: Disturnell. 1857. Pp. 206–217.) XII

Diversion of Niagara river. (Sci. Am., Mar. 17, 1906. 94: 226.) XI

Dixon, James. Personal narrative of a tour through a part of the United States and Canada: with notices of the history and institutions of Methodism in America. N. Y.: Lane and Scott. 1849. Pp. 110–124 IV

Dog goes over Niagara Falls alive (A). (Knowledge. 1882. 1: 574.)

Dollar, George. The Niagara fools. (Strand, Sept., 1897. 14: 332–336.) V

Donohoe, Thomas. The Iroquois and the Jesuits. The story of the labors of Catholic missionaries among these Indians. Buffalo: Catholic Publication Co. 1895. Pp. 32, 207 ff V

Dore, Gustave. Atala album, photographs of twelve illustrations to Chateaubriand's Atala. Phila.: Frederick Leypoldt. N. Y.: F. W. Christern. 1864 IX

Dorr, Eben P. Niagara's historic environs. (Four-track news. Feb., 1904. Pp. 110–113.) V

Dow, Charles Mason. Address to the international commissioners appointed to investigate concerning the conditions and uses of the waters adjacent to the boundary lines between Canada and the United States, at Niagara Falls, New York, September 14, 1905. (Ann. rep'ts of the com'rs of the state reserv. at Niagara, 22:67–75.) XI

—— The State Reservation at Niagara: a history. Albany. J. B. Lyon Co. 1914 XI

Dow, Charles Mason. Hennepin memorial address. (Ann. rep'ts of the com'rs of the state reserv. at Niagara. 27:10–16.).....XI

—— How to protect Niagara Falls. (Outl., Jan. 27, 1906. 82: 179–189.).....XI

—— Letter to Governor Odell, requesting him to veto the Niagara, Lockport and Ontario power company bill. (Ann. rep'ts of the com'rs of the state reserv. at Niagara. 21:215–229.).....XI

Drake, Joseph Rodman. Niagara. (*In his* Culprit fay and other poems. N. Y.: George Dearborn. 1836. Pp. 65–67.).....VIII

Dry as Niagara. (Outl., Nov. 24, 1906. 84: 690–691.)....XI

Dudley, Paul. An account of the falls of the river Niagara, taken at Albany, October 10, 1721, from Monsieur Borassaw, a French native of Canada. (Royal Society of London, Philosophical transactions. April-May, 1722. Pp. 69–72.).....I

Dufferin, The marchioness of. My Canadian journal, 1872–78. Extracts from my letters home written while Lord Dufferin was governor-general. New York: 1891. Pp. 39–40; 450.....XI

Dumas, A. L'utilisation des chutes du Niagara pour la production de l'energie electrique. (Le Genre civil. Feb. 8, 1896. 28:225–228.).....X

DuMond, F. V. Niagara illustrations. (*In* Trumbull, William, Legend of the white canoe. N. Y. & Lond.: Putnam. 1894.)..IX

Duncan, John M. Travels through part of the United States and Canada in 1818 and 1819. Glasgow. 1823. 2:52–57.....VII

—— Travels through part of the United States and Canada in 1818 and 1819. N. Y.: W. B. Gilley; New Haven: Howe & Spalding. 1823. 2:29–58.....III

[Duncan, *Mrs.* M. G. Lundie.] America as I found it. Lond.: Nisbet. 1852. Pp. 365–380.....IV

Dunlap, Orrin E. Accident to a ten thousand horse power alternator at Niagara. (Elec. rev., May 15, 1908. 62:823.)

—— Additional power facilities at Niagara Falls. (W. elec. Nov. 27, 1897. 21:299–300, 301.).....X

—— Calcic carbide plant at Niagara Falls. (W. elec. Jan. 18, 1896. 18:28–29.).....X

—— California and Niagara power transmission compared. (W. elec. Dec. 19, 1903. 33:459–460.)

—— Canadian electric power stations at Niagara. (Nature, Dec. 14, 1905. 73:161–162.).....X

Dunlap, Orrin E. The Canadian Niagara Falls development. (Elec. rev., May 5, 1905. 56:737.) X

—— Canadian Niagara [power company]. (Elec. rev., Feb. 10, 1905. 56: 233.)

—— The Canadian Niagara power development. (Elec. rev. Jan. 3, 1903. 42:12–15.)

—— Conveying the roar of Niagara by telephone to New York. (W. elec. May 30, 1896. 18: 265.) X

—— The crime against Niagara. (Harp. w., Apr. 7, 1906. 50: 474–476.) ..... X and XI

—— Curious engineering feat at Niagara. (Sci. Am., Nov. 11 and 25, 1905. 93: 382–423.) X

—— Developing power of lower Niagara. (W. elec., June 18, 1898. 22: 360.) X

—— Developments at Niagara Falls for the utilization of its power. (Elec. rev. Sept. 12, 1903. 43:344–349.) X

—— Dynamiting the Niagara ice jam. (Sci. Am., May 8, 1909. 100: 349–350.) V

—— Electric heaters in the great Niagara power house. (Elec. engr., Apr. 14, 1897. 23: 396–397.)

—— Electric power transmission at Niagara. (W. elec. Feb. 8, 1896. 18: 61–62.) X

—— Electrical development at Niagara Falls, Canada. (Elec. rev., Feb. 10, 1905. 56: 231.) X

—— Electrical matters at Niagara Falls. (Elec. wld., Jan. 4, 1897. 27: 8–9.)

—— Extension of the Niagara Falls hydraulic power and manufacturing company's plant. (Elec. engr., Nov. 25, 1897. 24: 508.)

—— Extension of the Niagara Falls power company's plant. (W. elec. July 31, 1897. 21: 60–61.)

—— Extension of the Niagara power house. (Elec. eng., Sept. 16, 1896. 22: 269–271.)

—— The extension of the power plant of the Niagara Falls power company. (Eng. news, Oct. 14, 1897. 38: 242.) X

—— Foolhardy attempts at passing the whirlpool rapids of Niagara. (Sci. Am., Sept. 28, 1901. 85: 201–202.) V

—— The frost-king at Niagara. (Booklover's mag. Dec. 1903. 2: 645–651.)

—— A great concrete retaining wall. (Sci. Am., May 12, 1906. 94: 395–396.) X

Dunlap, Orrin E. Heroes of Niagara. (Royal, May, 1902. 8: 57–66.)

—— The ice bridge in the Niagara gorge. (Eng. news, Feb. 9, 1899. 41: 82.) V

—— The ice condition at Niagara river. (Sci. Am., Feb. 7, 1903. 88: 93.) V

—— Illuminating Niagara with its own power. (Sci. Am., Oct. 19, 1907. 97: 273–274.) X

—— Illumination of Niagara Falls. (W. elec. July 24, 1897. 21: 43–44.

—— Is Niagara doomed? (Tech. wld., July, 1905. 3: 557–568.) XI

—— The latest hydro-electric power house at Niagara Falls. (W. elec. Mar. 23, 1907. 40: 250.)

—— Lightning strikes the Niagara power plant. (Sci. Am., Feb. 14, 1903. 88: 111.)

—— Lord Kelvin and the Niagara power transmission. (Elec. eng., Aug. 26, 1897.) X

—— Making sodium peroxide at Niagara. (Elec. eng., June 23, 1897. 23: 701.)

—— Manufacture of calcium carbide. (W. elec. May 16, 1896. 18: 233–235.)

—— The manufacture of carborundum. (Elec. power. Jan., 1896. 9: 1–5.) X

—— The manufacture of chemicals by Niagara power. (Elec. eng., Sept. 9, 1896. 22: 248–249.) X

—— More power at Niagara Falls. (W. elec. Mar. 21, 1896. 18: 133–134.) X

—— New concrete arch bridges at Niagara. (Sci. Am., Nov. 23, 1901. 85: 327.) XII

—— A new 130,000 horse-power plant at Niagara Falls. (Sci. Am., Oct. 6, 1906. 95: 244–245.) X

—— The new plant of the Canadian Niagara Falls company. (Sci. Am., Dec. 6, 1902. 87: 375–376.) X

—— New power development at Niagara Falls. (Cass. Mar., 1896. Pp. 484–487.) X

—— The new power house at Niagara. (Elec. rev., June 12, 1903. 52: 1023.)

—— New power house at Niagara Falls. (Sci. Am. sup., June 13, 1903. 55: 22941–22942.) X

Dunlap, Orrin E. The new steel arch bridge over Niagara Falls. (Eng. news, Jan. 2, 1896. 35:13–14.) XII

—— New wheel-pit of the Niagara Falls power company's power plant at Niagara Falls, New York. (Eng. news, Apr. 5, 1900. 43: 229–230.)

—— New work at Niagara Falls by the hydraulic company. (Elec. eng., July 28, 1898. 26: 73–75.)

—— Niagara and its notoriety-seekers. (Cosmop., Mar. 1902. 32: 333–335.) V

—— Niagara-Buffalo transmission line. (W. elec. Dec. 25, 1897. 21: 357.)

—— Niagara Falls as an electrical center. (W. elec., June 12, 1897. 20: 325–327.)

—— (The) Niagara Falls hydraulic power and manufacturing company's new work. (Elec. eng., Dec. 4, 1895. 20: 537–539.) X

—— Niagara Falls power supply interrupted by fire. (Eng. news, Feb. 5, 1903. 49:129.)

—— Niagara in winter. (Cosmop., Apr. 1900. 28: 593–604.) . V

—— Niagara model for the electrical exposition. (W. elec., Apr. 18, 1896. 18:181–182.) X

—— Niagara power development on the Canadian side. (W. elec. July 25, 1903. 33: 55–56.)

—— Niagara — the scene of perilous feats. (Cosmop., Feb. 1902. 32: 358–370.) V

—— Nikola Tesla at Niagara Falls. (W. elec., Aug. 1, 1896. 19: 55.) X

—— Novel features of the Niagara Falls lighting plant. (W. elec., Aug. 15, 1896. 19: 73–74.)

—— Old hydraulic canal plant at Niagara Falls transformed for electric transmission. (W. elec., Dec. 5, 1896. 19: 273–274.) . . X

—— One year of electric power transmission at Niagara Falls. (W. elec. April 4, 1896. 18:163.) X

—— Power development on the Canadian side of Niagara Falls. (Eng. news, Dec. 11, 1902. 48: 490–491.) X

—— Power transmission from Niagara Falls. (Cass., Jan., 1897. 11:197–204.) X

—— Prospects of Niagara power on the Canadian side of the Falls. (Sci. Am., Mar. 7, 1903. 88:176.) X

—— The recent subsidence of Niagara Falls. (Sci. Am., Mar. 6, 1909. 100:181, 187.) V

Dunlap, Orrin E. Remarkable diversion of Niagara's waters. (Sci. Am., Apr. 4, 1903. 88: 241.) V

—— The romance of Niagara bridges. (Strand. mag. Nov., 1899. 18: 425, 430–433.) XII

—— A short circuit at Niagara. (Elec. rev., Mar. 31, 1905. 56: 535.)

—— Transformer equipment for street railway service at Niagara Falls. (W. elec. Jan. 25, 1896. 18: 37.)

—— Transmission of Niagara power to Buffalo. (Elec. eng., Oct. 28, 1896. 22: 413–415.) X

—— (The) Use of Niagara power by the Buffalo general electric company. (Elec. eng., Jan. 5, 1899. 27: 17–22.)

—— Water supply of Niagara. (W. elec. Feb. 8, 1896. 18: 63.) XI

—— The wonderful story of the chaining of Niagara. (Wld's. work, Aug., 1901. 2: 1052–1054.) X

Dunlap, P. E., *comp.* Sheldon and Hawley's illustrated guide to Niagara Falls and points of interest. 1890 XII

Dunlap, William. A trip to Niagara; or, Travellers in America. A farce in three acts. Written for the Bowery Theatre, New York. N. Y.: E. B. Clayton. 1830 VIII

Dunlop, William. Recollections of the American war, 1812–14. Toronto: Historical Publishing Co. 1905. Pp. 56–58 V

Dunn, E——. Intermittent water-fall. (Sci. Am. December 4, 1915. 113: 492–493.) X

Duty on Niagara current. (Elec. wld. & eng. Jan. 12, 1907. 49: 92.)

Dwight, Theodore, Jr. The northern traveller; containing the routes to the springs, Niagara, Quebec, and the coal mines; . . . 6th ed. N. Y.: John P. Haven. 1841. Pp. 49–58 XII

Dwight, Timothy. Travels; in New-England and New-York. New Haven: Timothy Dwight. S. Converse, printer. 1821–1822. 4: 80–103 VII

E. Falls of Niagara. (Portfolio. May, 1811. 5: 450–452.) ... III

E. S. C. A legend of the Manitou rock. Containing also Professor Lyell's lectures upon the recession of Niagara Falls. Buffalo: Faxon. 1843 V

Early history of the falls and city. (St. ry. rev., Oct., 1897. 7: 634–636.) V

Eastman, F. S. A history of the state of New York from the first discovery of the country to the present time. N. Y.: Bliss. 1828. Pp. 5–6 V

Eaton, Amos. An index to the geology of the northern states, with transverse sections, extending from Susquehanna river to the Atlantic, crossing Catskill mountains; to which is prefixed a geological grammar. 2d ed. Troy, N. Y.: 1820. Pp. 214–215.....VII

Ebelings, Christoph Daniel. Erdbeschreibung und Geschichte von Amerika. Die vereinten Staaten von Nordamerika. Hamburg: Carl Ernst Bohn. 1793–1796. 2: 634–639.....V

Eddy, I. H. Map of the straights of Niagara from Lake Erie to Lake Ontario. 15 x 7. N. Y.: Prior & Dunning. 1813. (*In* Smith, D. W., A gazetteer of the province of upper Canada. N. Y.: Prior & Dunning. 1813.).....IX

[Editorial comment on Cassier's Niagara power number.] Outl., July 27, 1895. 52:128.)

Edmands, I. R. *and* others. Niagara Falls power and American industries; a symposium. (Trans. Am. electro-chem. soc. April, 1916. 29: 59–97.)

Edwards, C[harles] R. A story of Niagara. To which are appended reminiscences of a custom house officer. Buffalo: Breed, Lent. 1870. Pp. 1–289 VIII

Edwards, E. Jay. The capture of Niagara. (McClure, Oct., 1894. Pp. 423–435.) X

Edwards, Ernest. Niagara: photo-gravures from originals. Troy: Nims and Knight. N.d.....IX

Effect of power development on the Canadian Falls at Niagara. (Metal. & chem. eng. June, 1913. 11: 307.).....X

Effect of water diversion for power purposes on Niagara Falls. (Eng. news, Mar. 17, 1910. 63: 306–307.).....XI

Electric features of Niagara (The). (Elec. wld. June 5, 1897. 29: 719–734.) X

Electric machinery at Niagara (The). (Dub. rev. sci. not. April 1, 1894. 114: 421.)

Electric manufacture of sodium (The). (Elec. wld. June 5, 1897. 29: 733.)

Electric power at Niagara. (Harp. w. Jan. 3, 1903. 47: 31–35.).

—— (Sci. Am. supp. Jan. 24, 1903. 55: 22633.)

Electric power development at Niagara Falls (The). (Sci. Am., Aug. 12, 1905. 93:117–118.).....X

Electric power development at Niagara Falls, I. (Sci. Am., Aug. 12, 1905. 93: 125–126.).....X

Electric power development at Niagara Falls, II. (Sci. Am., Oct. 21, 1905. 93:320–321.).....X

Electric power development at Niagara Falls, III. (Sci. Am., Mar. 24, 1906. 94: 248–249.).....X

Electric power from Niagara Falls. (Elec. rev., Nov. 20, 1896. 39: 673.)

Electric power in a nut and bolt factory. (Elec. wld. Jan. 30, 1897. 29:183.).

Electric power in Ontario. (Power. Nov. 3, 1908. 29: 754.).....X

Electric railway bridge in Queen Victoria park railway. (W. elec. Sept. 5, 1903. 33:171.)

Electric railway development at Niagara Falls. (Elec. rev. July 28, 1906. 40: 234.).....X

Electric railways of the Niagara river region (The). (St. ry. jour., Oct., 1897. 13: 585–611.).....X

Electric scintillator may illuminate Niagara Falls. (W. elec. June 22, 1907. 40: 555.)

Electrical development at Niagara Falls. The new wheel pit. (Elec. rev. April 14, 1897. 30:169–170.).....X

Electrical features of Niagara (The). (Elec. wld. June 5, 1897. 29: 719–734.)

Electrical Niagara. (Power. Feb., 1895. 15:12.).....X

[Electrical review.] Editorial comment on the " alleged destruction " of the Falls. (Nov. 3, 1897. 31: 216.).....XI

Electrical transmission plant of the Niagara, Lockport, and Ontario power company. (Ry. & eng. rev. Jan. 4, 1908. 48: 9–12.)

Electricity at Niagara Falls. (Am. elec. June, 1897. 9: 211–219.).....X

—— (Elec. rev. June 9, 1897. 30: 269–270.)

—— (Eng. (Lond.:) June 26, 1903. 95: 646–650.)

Electro-chemical industries of Niagara Falls (The). (Electro-chem. & metal. ind. July, 1905. 3: 253–255.).....X

Electro-chemistry at Niagara Falls. (Pub. opin., July 22, 1897. 23:111.) X

Electrolytic generators at Niagara Falls. (Elec. rev. Nov. 3, 1897. 31:219.)

Electrolytic production of chlorate of potash (The). (Elec. wld. Jan. 14, 1899. 33:46.)

Eliza. Niagara. (Soc. lit. miss., Jan., 1837. 3:21–22.).....VIII

Ellicott, Andrew. Description of the Falls of Niagara. (Columbian mag., June, 1790. 4:331–332.).....II

—— View of the Falls of Niagara. Thackera & Vallance (sc.). 1790 IX

—— View of the Falls of Niagara. (Columbian mag. June, 1790. 4:331.) IX

—— View of the Falls of Niagara. (Mag. of Am. hist. July, 1880. 5:55.) IX

—— View of the Falls of Niagara. 3¾ x 7. (S. Hill, eng.). (Mass. mag. Boston: I. Thomas. July, 1790. 2:387.).....IX

Emily and Clara's trip to Niagara Falls; by the editor of "The youth's casket." N. Y.: Phinney, Blakeman, and Mason. (c. a. 1855.) Pp. 1:43.....VIII

Emmons, Richard. The Fredoniad or independence preserved; an epic poem on the late War of 1812. Bost.: William Emmons. 1827. 3 vol. *Also* 2d ed. Phila.: William Emmons. 1830. 1 vol..VIII

Endicott, ——. American Fall of the Niagara. (Grosvenor library, Buffalo, N. Y. Views of Niagara Falls. 1697–187–. Mat 23.)..IX

Engleheart, Gardner D. Journal of the progress of H. R. H. the Prince of Wales through British North America; and his visit to the United States, 10th July to 15th November, 1860. Privately printed. 1860. Pp. 63–66.....XI

Ensign, Bridgman and Fanning. Guide to the western rivers and lakes with engravings and railroad routes. N. Y.: Ensign, Bridgman and Fanning. 1856.....XII

Enys, *Captain.* Visit to Niagara. Journal of Capt. Enys, 29th regiment, 1787. (Rept. on Can. archives, 1886. Pp. ccxxvi–ccxxxiii.).II

Erosion at Niagara. (Nature. April 25, 1907. 75:607.)

Evans, Estwick. A pedestrious tour, of four thousand miles, through the western states and territories, during the winter and spring of 1818. Concord, N. H.: Joseph C. Spear. 1819. Pp. 76–81. (Thwaites, Early western travels, 1748–1846. 8:174–177.).....III

Evans, Lewis. A general map of the middle British colonies in America; viz., Virginia, Mariland, Delaware, Pensilvania, New Jersey, New York, Connecticut, and Rhode Island; of Aquanishuonigy, the country of the confederate Indians . . . comprehending their beaver hunting countries, of Lakes Erie, Ontario, and Champlain . . . Carefully copied from the original published at Philadelphia . . . Lond.: Printed for John Bowles. (*In* Evans, Lewis, Geographical, historical, political, philosophical and mechanical essays . . . Phila.: Printed by B. Franklin *and* D. Hall. 1755. P. 32.).....IX

—— A general map of the middle British colonies in America . . . Carefully copied from the original published at Philadelphia. Lond.: For John Bowles. 1771. (American maps, V, No. 16.).....IX

—— A general map of the middle British colonies in America, viz., Virginia, Maryland, Delaware, Pensilvania; New Jersey, New York, Connecticut, and Rhode Island, of Aquanishuonigy, the country of the confederate Indians . . . Corrected and improved with the addition of the line of forts on the back settlements by Thos. Jefferys. (*In* Jefferys, Thomas, General topography of North America and the West Indies. Lond.: Printed for Robert Sayer and Thomas Jefferys. 1768. No. 32.).....IX

—— A general map of the middle British colonies in America . . . carefully copied from the original published at Philadelphia in 1755, with some additions by J. Gibson.....IX

Everest, Robert. A journey through the United States and part of Canada. Lond.: John Chapman. 1855. Pp. 40.....IV

Eyre, John. The beauties of America. Buffalo: Steele. 1836. Pp. 59–65 III

Extension of the Niagara power plant (The). (Eng. mag., Nov., 1897. 14: 305–306.)

Extract from H. W. Buck in Cassier's magazine on Capture and uses of electrical development at Niagara Falls. (Sci. Am. sup. Dec. 19, 1903. 56:23386.).

Extraordinary ice jams at Niagara Falls. (Eng. news, Apr. 29, 1909. 61: 453.) V

F. C. H. Utilisation des chutes du Niagara. (Le Genre civil. Aug. 4, 1894. 25: 216–217.).....X

Facts and figures about Niagara. (Elec. wld. June 5, 1897. 29: 720.)

Fairbanks, J. H. A map of the vicinity of Niagara Falls. Drawn from actual survey for Tunis' guide. 16 x 21. Buffalo, N. Y.: E. R. Jewett & Co. 1857.....IX

Fairchild, Herman Leroy. Glacial waters in central New York. (N. Y. state museum. Albany: 1909. Bull. 127.).....VII

Fairholme, George. Geology. Lond.: 1837.....VII

—— New and conclusive physical demonstrations, both of the fact and period of the Mosaic deluge, and of its having been the only event of the kind that has taken place upon the earth. Lond.: James Ridgway and Sons. 1837. Pp. 157–203.....VII

—— On the falls of Niagara with some observations on the distinct evidence which they bear to the geological character of the North American plains. (London & Edinburgh phil. mag. 1834. 5:11–25.).....VII

Faith and courage of the pioneer (The). (Harp. w., June 14, 1913. 57, pt. 1: 24–25.).....X

Faithfull, Emily. Three visits to America. N. Y.: Fowler and Wells. 1884. Pp. 395–396.....IV

Fall des Niagara. (Grosvenor library, Buffalo, N. Y. Views of Niagara Falls. 1697–187–. Mat 4.).....IX

Fall of Niagara, Canada. (Grosvenor library, Buffalo, N. Y. Views of Niagara Falls. 1697–187–. Mat 16.).....IX

Falls harnessed (The). (St. ry. jour., Oct. 15, 1897. 7: 660–668.).....X

Falls of Niagara. N. Y.: Fless & Ridge Printing Co. (1891?).

—— (Leisure hour. Sept. 28, 1854. 3: 615–619.).

Falls of Niagara (The). 1764. From a newspaper of the day. (Mass. mag., 1790. 2: 592.).....II

Falls of Niagara and its water power (The). (Nature, Mar. 22, 1894. 49: 482–486.).....X

Falls of Niagara (The): being a complete guide to the points of interest around and in the immediate neighborhood of the great cataract; with views taken from sketches by Washington Friend, Esq., and from photographs. Lond.: T. Nelson and Sons. 1859.....XII

—— **depicted by pen and camera (The).** Buffalo and N. Y.: Matthews, Northrup and Co. N.d.....XII

—— **(The).** (In Glimpses of the wonderful. N. Y.: Wiley and Putnam. 1847. Pp. 73–82.).....V

—— **(The).** Grosvenor library, Buffalo, N. Y. Views of Niagara Falls. 1697–187–. Mat 1.).....IX

Falls of Niagara (The). Grosvenor library. Buffalo, N. Y. Views of Niagara Falls. 1697–187–. Mat 16.).....IX

—— **(The).** (Harp. w. Sept. 11, 1875. 19:139–141.)....IV

—— **(The).** (Home friend. Lond.: 1852. 1 no. 22:510–511.).....V

—— **in Canada.** Engraved by Scott from a drawing. Pub. by R. Wilkes, Jan., 1913. (Grosvenor library, Buffalo, N. Y. Views of Niagara Falls. 1697–187–. Mat 8.).....IX

—— **(The).** 1820. (Grosvenor library, Buffalo, N. Y. Views of Niagara Falls. 1697–187–. Mat 26.).....IX

—— **(The).** (Penny mag., Oct. 15, 1836. 5:405–406.).....V

—— reprints of Hennepin, Lahontan, newspaper 1764, Ellicott,-Rush, C. Williamson. (Mag. Am. hist. July, 1880. 5:47–56.)....IX

—— (Sat. mag., Dec., 1832. 1:250–251.).....V

—— **sketches by the way: a poem.** By an author for the first time. N. Y.: 1829.

—— **(The).** (Twenty years ago.) Grosvenor library, Buffalo, N. Y. Views of Niagara Falls. 1697–187–. Mat 9.).....IX

—— **(The).** [View.] 3½ x 4¼. (*In* The Lumiere, containing a variety of topographical views in Europe and America. N. Y.: H. R. Piercy & Co. 1831. P. 52.).....IX

—— [View.] 5½ x 11. [Inset to Popple, Henry, A map of the British empire in America. Fol. Lond.: W. H. Toms & R. W. Seale, 1733.].....IX

Farley, *Rev.* Frederick A. A visit to Niagara. (Lynch, Anna C., The Rhode Island book. Providence: Fuller. 1841. Pp. 69–80.).....IV

Faris, R. L. Digest of paper by Spencer on "Soundings under Niagara Falls and in gorge" later published in his "Evolution of Falls of Niagara." (Sci., Apr. 10, 1908. 27:587–589.).....VII

Fashionable tour (The): a guide to travellers visiting the middle and northern states and the provinces of Canada. 4th ed. enl. and imp. Saratoga Springs: G. M. Davison; *and* N. Y.: G. and C. and H. Carvill. 1830. Pp. 262, 268–275.....XII

Fashionable tour in 1825 (The). An excursion to the springs, Niagara, Quebec and Boston. Saratoga Springs: G. M. Davison. 1825. Pp. 119–124.....XII

Fashionable tour (The); or, A trip to the Springs, Niagara, Quebeck, and Boston, in the summer of 1821. Saratoga Springs: G. M. Davison. 1822. Pp. 99–110.....XII

Fawcett, Walden, The new Niagara. (Am. mf. & ir. wld. Dec. 25, 1902. Pp. 717–720.) X

Faxon's illustrated hand-book of travel by the Fitchburg, Rutland and Saratoga railway line, . . . Bost.: Faxon. 1873. Pp. 104–112 XII

Featherstonehaugh, G. W. On the ancient drainage of North America, and the origin of the cataract of Niagara. (Mon. Am. jour. of geol. and nat. sci. July, 1831. 1:13–21.) VII

Features of the Falls. (St. ry. rev., Oct. 1897. 7: 644–646.) . XII

Fenn, Alice Maud. Niagara. (Art jour. 1885. 38: 237–241.) IX

Fenn, Harry. Niagara. S. V. Hunt (sc.). N. Y.: D. Appleton & Co. 1873 IX

—— S. V. Hunt (sc.). Niagara. N. Y.: D. Appleton and Co. 1873. (Grosvenor library, Buffalo, N. Y. Views of Niagara Falls. 1697–187—. Mat 15.) IX

Fenning, D., Collyer, J., *and others.* New system of geography. Lond.: Crowder. 1765. 2: 641 V

Fer, N—— de. Le Canada, ou Nouvelle France, la Floride, la Virginie, Pensilvanie, Caroline, Nouvelle Angleterre et Nouvelle Yorck, l'Isle de Terre Neuve, la Louisiane et le Cours de la Rivière de Misisipi. Par N. de Fer. Geographe de Monseig. le Dauphin. À Paris. Chez l'auteur. 1702 IX

Ferguson, William. America by river and rail; or, Notes by the way on the new world and its people. Lond.: James Nisbet. 1856. Pp. 441–458 ..... IV & IX

Fernald, Frederick Atherton. The index guide to Buffalo and Niagara Falls. . . . Buffalo, N. Y.: F. A. Fernald. 1910 . . . XII

Ferrall, S. A. A ramble of six thousand miles through the United States of America. Lond.: Effingham Wilson. 1832. Pp. 28–35 XII

Ferree, J. W. The falls of Niagara and scenes around them. N. Y.: A. S. Barnes and Co. 1876 IV

Fidler, Isaac. Observations on professions, literature, manners, and emigration, in the United States and Canada, made during a residence there in 1832. Lond.: Whittaker, Treacher. 1833. Pp. 209–214 III

Fields, Annie, *ed.* Life and letters of Harriet Beecher Stowe. Bost. and N. Y.: Houghton, Mifflin. [1897.] Pp. 89–90 III

Finch, I. Travels in the United States of America and Canada. . . . Lond.: Longman, Rees. 1833. Pp. 328–331 VII

Fire at the Niagara Falls power company's plant. (Elec. rev. Feb. 7, 1903. 42: 202.)

First impressions of America. (Leisure hr., June 3, 1871. 20: 344–346.) V

Fisher, Richard Swainson. A new and complete statistical gazetteer of the United States of America. N. Y.: J. H. Colton. 1853. . . . V

Fitzgerald and Bennie laboratories in Niagara Falls (The). (Metal. & chem. eng. Sept., 1912. 10: 535–536.)

Fitzgerald, Francis A. Manufacture and development of corborundum at Niagara Falls. (Jour. Frank. inst., Feb., 1897. 143: 81–96.) X

Five thousand horse-power turbines for the Niagara power plant (The). (Eng. news, Mar. 30, 1893. 29: 294.) X

Fleming, William. Four days at Niagara Falls, in North America. Manchester: Love and Barton. 1840. III

Flint, James. Letters from America, containing observations on the climate and agriculture of the western states, the manners of the people, the prospects of emigrants. . . . Edinb.: W. and C. Tait. 1822. Pp. 290–294. (Thwaites, Early western travels, 1748–1846. 9: 317–320.) III

Flint, Timothy. History and geography of the Mississippi valley. . . . 2d ed. Cincinnati: Flint, Lincoln. 1832. 1: 443–445 V

—— [Niagara Falls in 1828.] (Western monthly review. Cincinnati. 2: 255–260.) III

Flynne, P. C. Niagara Falls. 8 x 15. 1893. IX

Folly and courage at Niagara. (Knowl. Sept. 7, 1883. 4: 152–153.) V

Food factory (A). Harp w. June 14, 1913. 57: pt. 1, 15.)

"Fool Killer" taking soundings (The). (Sci. Am., Oct. 5, 1901. 85: 211.) VII

Foot, Lyman. Notices of geology and mineralogy (of Niagara Falls region.) (Am. jour. of sci. 1822. 4: No. 1, 35–37.) VII

Forbes, George. Harnessing Niagara. (Black. Sept., 1895. Pp. 434–444.) X

—— Harnessing Niagara. (Critic, Oct., 1895. 125: 507–518.)

Forbes, George. The utilization of Niagara. (Jour. soc. arts, Dec. 16, 1892. 41: 90–97.) X

Forster, John. Life of Charles Dickens. Phila.: J. B. Lippincott. 1872–1874. 1:404–405, 3:433.....IV

F[oster], F[anny] E[liza]. Lines to a friend at Niagara. (*In her* Pebbles of poetry. Bost.: Foster. 1858. P. 20.).....VIII

Foster, Horatio A. Niagara power in Buffalo. (W. elec., Jan. 8, 1898. 22:26–27.).....X

Four Kings of Canada (The), being a succinct account of four Indian princes lately arriv'd from North America, with a particular description of their country . . . with several other extraordinary things worthy of observation, as to the natural or curious productions, beauty, or fertility of that part of the world. London. 1710. Reprinted by J. E. Garratt and Co. London. 1891. Pp. 41–42..I

Fourth progress report of the international waterways commission. (Eng. news, Jan. 21, 1909. 61:84–86.).....XI

Fowler, John. Journal of a tour in the state of New York, in the year 1830. . . . Lond.: Whittaker, Treacher and Arnot. 1831. Pp. 131–147.....XII

Fowler, Reginald. Hither and thither; or, Sketches of travels on both sides of the Atlantic. Lond.: Daldy. 1854. Pp. 204–213....XII

Fowler, Thomas. The journal of a tour through British America to the Falls of Niagara . . . written during the summer of 1831. Aberdeen: Smith. 1832. Pp. 214–231.....III

Francis Abbott: or, The hermit of Niagara. A tale of the old and new world. By the author of Matallak &c. Boston: Gleason's Publishing Hall. 1846.....VIII

[Frankenstein, G. N.] Niagara. (Harp. Aug., 1853. 7:289–305.).....IX

—— Niagara Falls. (Jones sc.) E. Forrett & Co. Phila.: (1853.).....IX

Franquelin, Jean Baptiste Louis. Carte de la Louisiane ou des voyages du sr. de la Salle & des pays qu'il a découverts depuis la Nouvelle France jusqu'au golfe Mexique, les années 1679, 80, 81 & 82. 20½ x 16. Paris: 1684. (*In* Thwaites, R. G. ed., Jesuit relations. Cleveland: Burrows Bros. 1900. 63: opp, title page.) .IX

—— Map of 1688 of North America. (*In* Marshall, Orasmus H., Historical writings. Albany: Munsell & Sons. 1887. P. 93.)..IX

Fraser, J. Malcoln. Niagara in winter. (Pearson's mag. Dec. 1897. 4:599.).....V

Fraser, John. Canadian pen and ink sketches. Montreal: Gazette Printing Co. 1890. Pp. 155–156.....IV

Fraser, John Foster. America at work. Lond.: Cassell. 1903. Pp. 177–188 X

Frechette, Louis. Le Niagara. (*See* Michigan Central Railroad Company. From city to surf. . . . Chicago: Rand, McNally. 1888. P. 63.) VIII

Freeman, L. R. Big four in water power. (Tech. world. March, 1915. 23: 24–27.)

French, Benjamin Franklin. Louisiana historical collections. N. Y.: Wiley and Putnam. 1846. 2: 249–250.....V

French, J. H. Gazetteer of the state of New York. . . . Syracuse: Smith. 1860. Pp. 449–450.....V

Friend, Washington. General view of Niagara Falls. 1846..IX

—— View of the Canadian Fall.....IX

—— Views of Niagara Falls. (*In* Falls of Niagara: a complete guide. . . . T. Nelson & Sons. Lond., Edinb., N. Y. & Toronto. 1846.) IX

Frizell, Joseph Palmer. Water-power, an outline of the development and application of the energy of flowing water. N. Y.: J. Wiley & Sons. Lond.: Chapman & Hall. 1900.

[**Frontispiece** of vicinity showing development and editorial on electrical power development at Niagara Falls.] (Sci. Am., Aug. 12, 1908. 93:117–118.)

Fryer, Thomas T. A catalogue of books, pamphlets, engravings, etc., relating largely to Niagara Falls. Buffalo, N. Y.: T. T. Fryer. 1894.

Fullerton, Aubrey. Repairing Niagara Falls. (Tech. wld. June, 1912. 17: 435.).....XI

Fulton, *Mrs.* Linda de K. Nadia, the maid of the mist: a story of Niagara. Buffalo: 1901.....VIII

Fumugalli, P. ——. Niagara. (Grosvenor library, Buffalo, N. Y. Views of Niagara Falls. 1697–187—. Mat 5.).....IX

Further development of Niagara Falls power. (Sci. Am., Oct. 11, 1902. 87: 234.).....X

Future of Buffalo, Tonawanda, Niagara Falls and the tunnel; the great power (The). Buffalo: Niagara printing Co. n.d.

G. A. G. C. Erosion at Niagara. [Review of Gilbert's "Recession of Niagara Falls and report of Carvel Hall in Bull. of U. S. geol. surv. No. 306. 1907.] (Nature. 1907. 75: 607.) VII

G. H. Installation Hydro-électrique des chutes du Niagara. Nouveaux développements. (Le Genie civil. Mar. 3, 1900. 26: 280–302.) X

—— La nouvelle fossé aux turbines de la Niagara Falls power company. Le Genie civil. May 11, 1901. 39: 26.) X

Galinee, René Brehan de. Exploration of the Great Lakes. 1669–1670. by Dollier de Casson and De Bréhan de Galinée. Galinée's narrative and map, with an English version, including all the map legends. Translator and editor, James H. Coyne. Toronto: the Society. 1903. (Ontario Historical Society, papers and records. 4: 38–41.) I

Galt, John. The bachelor's wife. Edinb.: Oliver and Boyd. 1824. Pp. 285–292 V

—— The early missionaries: or, The discoveries of the Falls of Niagara. (The museum of for. lit. and sci., Oct., 1831. 19: (new ser. 12), 397–400.) VIII

Garbett, E. L. Recession of Niagara Falls in one hundred thirty-three years. (Nature. July 16, 1885. 32: 244–245.) VII

Garczynski, R. E. Niagara (*In* Bryant, William Cullen ed. Picturesque America. N. Y.: Appleton. [1872] 1: 432–451.) V

Gaskell, Mrs. An incident at Niagara. (Harp. w., June, 1858. 17: 80–82.) VIII

Gazetteer of the province of Upper Canada (A): to which is added an appendix, describing the principal towns, fortifications and rivers in Lower Canada. N. Y.: Prior and Dunning. 1813 V

Gazzetiere Americano. . . . Livorno: Coltellini. 1763. 3: 5–9. V

Geddes, James. Observations on the geological features of the south side of the Ontario valley in a letter to F. Romeyn Beck. (Am. jour. of sci. Oct., 1826. 11: 213–218.) VII

Geikie, Cunningham. Life in the woods. Lond.: Strahan. 1873. Pp. 347–371 IV

Geil, Samuel. Map of the vicinity of Niagara Falls. Phila.: James D. Scott. N.d. IX

Geil, Samuel *and* Delp, J. L. Map of the vicinity of Niagara Falls. From actual surveys by Samuel Geil. Colored. 22 x 28. Phila.: [1853.] IX

Gendron, Le Sieur. Qvelqves Particvlaritez dv pays Des Hvrons en la Novvelle France Remarquées par le Sieur Gendron, Docteur en Medicine, qui a demeuré dans ce pays-la fort long-temps. Redigées par Iean Baptiste de Rocoles, Conseiller et Aumosnier du Roy, & Historiographe de sa Majesté. A Troyes, & A Paris, chez Denys Bechet, . . . et Lovis Billaine, . . . MDCLX. Pp. 7–8. Colophon: Achevé d'imprimer à Albany, N. Y., par J. Munsell, ce 25 Aôut, 1868. I

General electric company. The industrial value of Niagara Falls. [Washington: 1906.] (United States.— Rivers and harbors committee, House doc., 59th cong., 1st sess. No. 4.)

—— Niagara power on the street railways of Buffalo and vicinity. Schenectady: 1901 X

Geographical, historical, commercial and agricultural view of the United States of America. . . . Lond.: Edwards and Knibbs. 1820. Pp. 18–20.....V

Geology of Niagara. (Sci. Am. sup. March 3, 1900. 49: 20208.) VII

Geology of Niagara Falls (The). (Chambers' jour., Oct. 9, 1847. 8: 229–231.).....VII

Geyelin, Emil. Geyelin-Jonval turbines in the plant of Niagara Falls paper company. (Eng. news, Apr. 5, 1894. 31: 278–279.) X

Giacosa, Giuseppe. Impressioni d'America. Milano: Cogliati. 1908. Pp. 130–157 IV

Gibbes, L. R. On some points which have been overlooked in the past and present condition of Niagara Falls. Charleston: 1857. VII

—— Remarks on Niagara Falls. (Proc. A. A. A. S. (Aug., 1856.) 1857. 10: pt. 2, 69–78.).....VII

Gibson, John. Great waterfalls, cataracts, and geysers. Lond.: Thomas Nelson and Sons. 1887. Pp. 16–51.....V

Gignoux's Niagara. (Harp. w., July 9, 1859. 3: 436.) IX

Gilbert, Grove Karl. Evolution of Niagara Falls. Review of Spencer's book. (Sci., July 31, 1908. 28: 148–151.) VII

—— The history of the Niagara river. (Ann. rep'ts of the com'rs of the state reserv. at Niagara. Albany: 1890. 6: 61–84.) VII

—— The history of the Niagara river. (Ann. rep'ts of the Smith. inst. 1890. Gen. app. Pp. 231–257.).....VII

—— Niagara Falls and their history. (Nat'l geographic monographs. Sept., 1895. 1: no. 7.).....VII

—— Niagara river as a geologic chronometer. (Nature, May 17, 1894. 50: 53.).....VII

Gilbert, Grove Karl. The place of Niagara Falls in geologic history. [Abstract] (Proc. A. A. A. S. Aug., 1886. 35: 222–223.) . . . VII

—— The rate of recession of Niagara Falls — I. (Sci. Am. sup., Apr. 20, 1907. 63: 26157–26160.) VII

—— The rate of recession of Niagara Falls — II. (Sci. Am. sup., Apr. 27, 1907. 63: 26179–26183.) VII

—— Rate of recession of Niagara Falls. Accompanied by a *Report of survey of crest line of Niagara Falls*, by W. Carvel Hall. U. S. geol. survey, Bull. 306. 1907. (Ann. rep'ts of the com'rs of the state reserv. at Niagara. Albany: J. B. Lyon. 1907. 23: 39–73.) VII

—— Recent earth movement in the great lakes region. Extract from the 18th annual report of the United States geological survey. 1896–97. Pt. 2. (Ann. rep'ts of the com'rs of the state reserv. at Niagara. 1899. 15: 69–138.) VII

Gilbert, Howard Worcester. Niagara. (*In his* Aldornere and two other Pennsylvania idylls. . . . Bost.: Index Ass'n. 1885. Pp. 87–88.) VIII

Gilder, Richard Watson. At Niagara. (*In his* Poems. Bost. & N. Y.: Houghton Mifflin & Co. 1908. Pp. 215–216.) VIII

Giles, Charles. Pioneer; a narrative of the nativity, experience, travels, and ministerial labors of the Rev. Charles Giles. . . . with incidents, observations, and reflections. N. Y. G. Lane and P. P. Sandford. 1844. III

Gillette, King C. The human drift. Boston: New era pub. co. n.d. (1894). Pp. 87–89 X

Gilman, Caroline. The poetry of travelling in the United States. With additional sketches, by a few friends; and A week among autographs, by Rev. S. Gilman. N. Y.: S. Colman. 1838. Pp. 106–116 III

Gilpin, T. A northern tour. . . . Phila.: Carey. 1825. Pp. 145–150 XII

Glover, H. J. The great international railway suspension bridge over the Niagara river in full view of the Falls, connecting the United States and Canada, the New York Central and Great Western railways. (Grosvenor library, Buffalo, N. Y. Views of Niagara Falls. 1697–187—. Mat 17.) IX

—— Goat Island, Niagara. (*In* Rhine, Alice Hyneman, Niagara park illustrated. . . N. Y.: Niagara Pub. Co. 1885. c. P. 77.)

[Gluck, J. F.] A little guide to Niagara Falls. . . . By an old resident. Buffalo and N. Y.: Matthews, Northrup and Co. 1890. . XII

Goat Island, Niagara. (*In* Rhine, Alice Hyneman, Niagara park illustrated. . . . N. Y.: Niagara Pub. Co. 1885. c. P. 77.) VIII

Godley, John Robert. Letters from America. Lond.: John Murray. 1844. 1:132–139. IV

Goldsmith, Oliver. The traveller, or a prospect of society. (*In his* Poetical works. Bost.: Houghton, Mifflin and Co. N.d. P. 24. [British poets]) VIII

Golovine, Ivan. Stars and stripes; or, American impressions. Lond. and N. Y.: 1856. Pp. 15–20. IV

Goodrich, S. G. A pictorial geography of the world. . . . Bost.: Otis, Broaders. 1840. Pp. 231–236. V

Gordan, Thomas F. Gazetteer of the state of New York. . . . Phila. 1836. Book I, Pp. 17–22. V

Gorge road at Niagara (The). (Sci. Am. Mar. 28, 1896. 74: 193–199.) X

Gosman, Robert. Narrative of John Vanderlyn's tour to Niagara in 1802. (Pub. Buf. hist. soc. 15:159–173.) IX

Gosselman, Karl August. Resa i Norra Amerika. Itvenne Delar Nyköping: (P. E. Winge.) 1835. Förra Delen. Pp. 174–224. . III

Gould, Hannah F. Flower of Niagara. (*In her* New poems. Bost.: Reynolds. 1850. Pp. 150–152.) VIII

Gourlay, Robert Fleming. Statistical account of upper Canada. . . . Lond.: Simpkin and Marshall. 1822. Vol. I, Pp. 63–77.)

Government and Niagara Falls (The). (Outl., Feb. 16, 1907. 85: 335.) XI

Government regulation of Niagara power. (Sci. Am., Feb. 16, 1907. 96:146.) XI

[Governor Robinson's message.] (Nation, Feb. 6, 1879. 28: 101–102.) XI

Governor Sulzer urges state control of Niagara water power. (Elec. wld. & eng., Apr. 12, 1913. 61: 768.) XI

Grabau, Amadeus W. Guide to the geology and paleontology of Niagara Falls and vicinity, with a chapter on postpliocene fossils of Niagara by Elizabeth J. Letson. (Bul. of the N. Y. state museum, April, 1901. 9: No. 45. Also Bul. of the Buf. Soc. of Nat. Sci. 7:1, p. 284.) VII

—— Guide to the geology and paleontology of Niagara Falls and vicinity. (Ann. rep'ts of the com'rs of the state reserv. at Niagara. Albany: 1901. 18: app. 1–152.)

Grand Trunk Railway. Excursion routes and rates from Buffalo and Niagara Falls via Grand trunk railway and Richelieu and Ontario navigation company's steamers. Buffalo: 1886. Pp. 1–3.....XII

Grand Trunk Railway system. Across Niagara's gorge. [Battle Creek, Mich. n.d.].....XII

——. (Gateways of tourist travel. Pen and camera pictures of scenery reached by the Grand Trunk Railroad system and connections. n.d. 1897. Pp. 9–16.).....XII

—— (Summer resorts reached by the Grand Trunk railway and its connections. . . . [Buffalo, 1888.] Pp. 47–51.).....XII

Grand Trunk tourists' guide. Buffalo: Matthews, Northrup and Co. (1886).....XII

Grande chute du Niagara. (163 P. de Haut.) (Grosvenor library, Buffalo, N. Y. Views of Niagara Falls. 1697–187—. Mat 5.).....IX

Granger, James N. *and* Paine, *Barker R.* The great tunnel at Niagara Falls. . . . Rochester, N. Y.: Union and advertiser press. 1893.

Grant, G. C. Niagara Falls as an index of time. (Hamilton Scientific Assn. jour. and proc. 1901. 17: 78–83.).....VII

Grave of Washington (The); villa of Mount Vernon, and key to the Bastille; and banks of Niagara. Edinburgh: William Whyte and Co. 1846. Pp. 37–40.....VIII

Gray, David. Letters, poems and selected prose writings. Buffalo: Courier Co. 1888. Pp. 347–351.....IV

Gray, Hugh. "Map of Canada, etc." (*In his* Letters from Canada, written during a residence there in the years 1806, 1807, 1808. . . . Lond.: Longman, Hurst, Rees, and Orme. 1809.).....IX

Great cataract of Niagara; its wonders, past and present (The). Buffalo: Matthews, Northrup and Co. 1889.....XII

Great continental as well as national enterprise (A). Continuous water and steam navigation, from the valley of the Mississippi to the Atlantic ocean. Des Moines: Mills and Co. 1871.

Great Falls of Niagara (The). [Engraving on map of the northern provinces of the United States drawn and engraved for Thompson's New general atlas, 1817.] (*In* Maps; historical and miscellaneous. Fol. No. 89. Grosvenor library, Buffalo, N. Y.).....IX

Great Gorge Route. Niagara Falls and the Niagara gorge: being photographs by C. D. Arnold and G. E. Curtis; with text explanatory of the views. Niagara Falls: 1899.....XII

Great Lakes and Niagara (The). (Geog. jour. (Lond.), Feb., 1896. 7: 204–205.).....VII

Great power house at Niagara (A). (Sci. Am., June 18, 1898. 78: 393–394.).....X

Great tunnel at Niagara (The). (Power. Sept., 1890. 12: 1–2.).....X

Greater Buffalo and Niagara frontier. Commercial and industrial. . . . Publicity committee of the Buffalo chamber of commerce. 1914.....XII

—— Niagara Falls, the Tonawandas, Lockport and Depew, commercial and industrial. . . . [Buffalo] Buffalo chamber of commerce. 1914. Pp. 70–72.

Greater Niagara. Niagara Falls; Mrs. S. D. Morse. 1896....IV

Green, Andrew H. Communication . . . relative to the state reservation at Niagara. [Albany: 1896.]

—— Last public address of the late Hon. Andrew H. Green, concerning the state reservation at Niagara. (Ann. rep'ts of the com'rs of the state reserv. at Niagara. 20: 91–104.).....XI

—— Letters concerning the diversion of waters from Niagara Falls. (6th ann. rep't of the com'rs of the state reserv. at Niagara. Albany: 1890. 6: 57–60.).....XI

—— Letter to J. W. Langmuir, chairman, commissioners of Queen Victoria Niagara Falls park, under date of October 19, 1894, concerning the diversion of water at Niagara Falls. (Ann. rep't of the com'rs of the state reserv. at Niagara. 12: 51.).....XI

—— Letters to Theodore E. Hancock, attorney general of the state of New York, under date of July 17 and 18, 1894, concerning the diversion of water at Niagara Falls. (Ann. rep't of the com'rs of the state reserv. at Niagara. 12: 52–53.).....XI

—— Letter to Walter Q. Gresham, secretary of state, Washington, concerning the diversion of water at Niagara Falls, under date of October 17, 1894. (Ann. rep't of the com'rs of the state reserv. at Niagara. (12: 49–50.)

—— Saving Niagara. (*In* American park and out-door art association. General addresses of the 7th annual meeting. Buffalo, July, 1903. 7: pt. 4, 12–18.).....XI

Green, Andrew H.; Bogart, John; Kibbe, August S. Letters concerning surveys and appropriations. (Ann. rep't of the com'rs of the state reserv. at Niagara. Albany: 1891. 7:81–88.).....XI

Greene, Charles E. The cantilever bridge at Niagara. (Sci. May 9, 1884. 3:572–574.)

Greene, Francis Vinton. The equities at Niagara . . . [Wash.] (1908).....X

—— Niagara Falls in 1907. Ontario power co. of Niagara Falls..X

Greene, J. W. Free Niagara. Buffalo: Matthews, Northrup and Co. (1885.).....XI

Greene, S. Dana. Distribution of the electrical energy from Niagara Falls. (Cass. July, 1895. 8:333–362.).....X

Greenleaf, James L. Report on the water-powers of the drainage basins of Lakes Huron and Erie, in the United States, with report on the water-power of the Niagara river. (Final reports, 10th census. 16:487–512.)

Also in U. S. 47th cong., 2d sess. H. Misc. docs., v. 13, No. 42, Pt. 16; serial 2146.

Greenwood, Francis William Pitt. Falls of Niagara. (The monthly repository and library of entertaining knowledge. Sept., Oct., Nov., 1832. 3:111–116; 149–152; 186–188.)

—— Miscellaneous writings. Bost.: Crosby and Nichols. [1846] Pp. 290–308.....III

Greenwood, Thomas. A tour in the states and Canada. Out and home in six weeks. Lond.: Gill. 1883. Pp. 69–73.....V

Gregory, Henry Ellsworth. Legal status of the Niagara river. N. Y.: 1906.....XI

Gregory, J. W. Niagara as a geological chronometer. (Nature, Nov. 5, 1908. 79:11–12.).....VII

Griffin, *Sir* Lepel Henry. The great republic. Lond.: Chapman and Hall. 1884. Pp. 22–30.....XI

Grimshaw, Robert. Three million horse-power in winter. (Cass. Jan., 1893. Pp. 173–179.).....X

Grinfield, Thomas. Hymn on Niagara. (*In* Barham, William, Descriptions of Niagara; selected from various travellers; . . . Gravesend: n.d. Pp. 176–177.).....VIII

Groome, W——. Graham, A. W. Niagara. (Grosvenor library, Buffalo, N. Y. Views of Niagara Falls. 1697–187–. Mat 16.).IX

Grosvenor Library, Buffalo, N. Y. Views of Niagara Falls, taken from various sources. 1697–187–.....IX

Guernsey, Alfred H. Niagara. (Harp., Aug., 1853. 7:289–305.) IX

Guest, *Lady* Theodora. A round trip in North America . . . Lond.: Edward Stanford. 1895. Pp. 187–194.....VI

Guide to Niagara Falls . . . Phila.: G. W. Childs. 1864. Another edition in 1868.

—— Niagara Falls: Niagara Falls Gazette. n.d.....XII

—— historical, descriptive, and short sketches from many authors. Buffalo: J. C. Prescott, excursion manager, Erie railroad. N.d...XII

Gunning, W. D. The past and future of Niagara. (Pop. sci. mo., Sept., 1872. 1:564–573.).....VII

Gurney, Joseph John. A journey in North America, described in familiar letters to Amelia Opie. Norwich: Printed for private circulation. 1841. Pp. 317–324.....III, VI, VIII

Guthrie, William Norman. Niagara twice seen, and other verse. [Sewanee, Tenn.]: Univ. Press; Cincinnati: Clarke. [c 1910.] Pp. 1–32 VIII

Gzowski, *Sir* Casimir S. Description of the international bridge constructed over the Niagara river near Fort Erie, Canada, and Buffalo. Toronto: 1873.

H. E. D. The fugitive slave's apostrophe to Niagara. (*In* Buckingham, Joseph T., Personal memoirs and recollections of editorial life. Bost.: Ticknor, Reed, Fields. 1852. 2:192–194.).....VIII

H. E. J. "A poem of the elements," an appreciation of Niagara: August, 1891. (Critic, Sept. 22, 1894. 25:181.).....VIII

H. D. M. The Falls of Niagara. (West. lit. mess'gr., Aug. 17, 1842. 2:56.) VIII

Hackstaff's new guide book of Niagara Falls . . . Niagara Falls, N. Y.: W. E. Tunis and Co. 1853.....XII

Hadfield, Robert. Memorial as to the proposed Niagara ship canal, the course of commerce on the lakes, etc. See statistics and information relative to the trade and commerce of Buffalo for the year ending December 31, 1871 . . . Reported by William Thurstone, Secretary. Buffalo: Warren, Johnson and Co. 1872. Pp. 109–120.....XII

Hall, *Captain* Basil. Travels in North America, in the years 1827 and 1828. Edinb.: Cadell. 1829. 1:177–208; 351–354....III

—— Forty etchings, from sketches made with the camera lucida, in North America, in 1827 and 1828. 4th ed. Edinb. and Lond.: 1830. No. 1-VI.....IX

Hall, *Captain* Basil. I. Niagara from below. II. Niagara from above. III. Niagara on the American side. IV. Bridge across the rapids at Niagara. V. A general view of the Falls of Niagara. VI. The river Niagara flowing into Lake Ontario. (Grosvenor library, Buffalo, N. Y. Views of Niagara Falls. 1697–187–. Mat 11.) .IX

—— Notice of the pressure of the atmosphere, etc., within the cataract of Niagara. (Jour. Frank. inst. 1827. 5:48–51.) VII

Hall, Francis. The Niagara frontier. 7½ x 10. (*In his* Travels in Canada and the United States in 1816–1817. Lond.: Longman, Hurst, Rees, Orme, & Browne. 1818.) IX

—— Travels in Canada and the United States, in 1816 and 1817. Lond.: Longman, Hurst, Rees, Orme, & Brown. 1818. Pp. 230–238 III

Hall, James. Niagara Falls and river. (Ann. rep'ts of the fourth geol. dis't of N. Y. 1838. Pp. 171–173.) VII

—— Niagara Falls; their physical changes, and the geology and topography of the surrounding country. Bost.: 1844 VII

—— Niagara Falls — their physical changes, and the geology and topography of the surrounding country. (Bost. jour. nat. hist., Jan., 1842. 4:106–134.) VII

—— Niagara Falls; its past, present and prospective condition. (Ann. rep'ts of the com'rs of the state reserv. at Niagara. Albany: 1892. Pp. 67–89.) VII

—— Niagara Falls, its past, present, and prospective condition. (Geology of N. Y. Pt. 4. Fourth geological dis't. Pp. 383–401.) VII

—— Niagara Falls; their physical changes, and the geology and topography of the surrounding country. Bost.: 1844.

—— Note [on recession of Niagara Falls]. (Proc. A.A.A.S. (Aug., 1856.) 1857. 10: pt. 2, 76–78.) VII

—— [On the geology of the region of Niagara Falls.] (Proc. Bost. Soc. of Nat. Hist. Boston: 1844. 1:52.) VII

—— Trigonometrical survey and map of Niagara Falls. (Geology of N. Y. Pt. 4. Fourth geological dis't. Pp. 402–404.) VII

Hall, Lansing V. Ode to Niagara. (*In his* Voices of nature. N. Y.: Gray and Green. 1868. Pp. 192–193.) VIII

Hall, W. Carvel. Report of survey of the crest line of Niagara Falls. (Ann. rep'ts of the com'rs of the state reserv. at Niagara. 1906. 23:67–73.) VII

Hall *and* Mooney. Niagara Falls from near the head of the ferry stairs. (Grosvenor library, Buffalo, N. Y. Views of Niagara Falls. 1797–187–. Mat 17.) IX

—— View from the pagoda. (Grosvenor library, Buffalo, N. Y. Views of Niagara Falls. 1697–187–. Mat 17.) IX

Hallett, P——. Notes on Niagara. (Brit. Assn. for the A. S. Report of 54th meeting. 1885. Pp. 774–745.) VII

Hamilton, Thomas. Men and manners in America. Edinb. and Lond.: 1833. 2: 314–331 VII

Hamilton, ——. Niagara Falls, American side. 11x 24. Eng. by J. M. Butler. Phila.: (1845.) IX

—— Niagara Falls, Canada side. 11 x 22. Eng. by J. M. Butler. Phila.: (1845.) IX

Hamilton, J——. Niagara Falls. (American side.) (Grosvenor library, Buffalo, N. Y. Views of Niagara Falls. 1697–187–. Mat 19.) IX

—— Niagara Falls. (Canadian side.) (Grosvenor library, Buffalo, N. Y. Views of Niagara Falls. 1697–187–. Mat 20.) IX

Hammond, Clark H. State development of water power. N. Y. state conserv. dep't. Albany: 1912 XI

Hanaford, *Mrs.* Phebe A. Niagara. (*In her* From shore to shore and other poems. Bost.: D. B. Russell. San Francisco: A. L. Bancroft & Co. 1871. P. 215.) VIII

Hancock, R——. The waterfall of Niagara. Published by Laurie & Whittle, 53 Fleet St., Lond.: 12 May, 1794 IX

Hancock, Theodore E. Opinion concerning the diversion of water at Niagara Falls, under date of November 16, 1895. (Ann. rep'ts of the com'rs of the state reserv. at Niagara. 12:53–61.) XI

Handbook to the Pan-American exposition, Buffalo and Niagara Falls. Chicago: Rand, McNally. [1899–1901 c] Pp. 182–237 XII

Hands off Niagara. (Outl., Mar. 29, 1913. 103: 702–703.) . XI

Hardie, James. A dictionary of the most uncommon wonders of the works of art and nature. N. Y.: Samuel Marks. 1819. Pp. 275–278 V

Hardy, Mary McDowell Duffus, *Lady*. Between two oceans . . . Lond.: Hurst and Blackett. 1884. Pp. 37–55 IV

—— Through cities and prairie lands. Sketches of an American tour. N. Y.: R. Worthington. 1881. Pp. 56–58 IV

Harnessing Niagara. (Power. May, 1890. 10:1–2.).

Harnessing of Niagara. Cassier mag. co. N. Y. and Lond.: 1895 X

Harrevelt, E—— van. Carte de la Nouvelle Angleterre, Nouvelle York et Pensilvanie. (*In his* Histoire générale des voyages. A Amsterdam: 1774. 21:263.) IX

—— Carte des lacs du Canada. (*In his* Histoire générale des voyages. A Amsterdam: 1774. 21:452.) IX

—— Cataracte de Niagara. N.v.d. Meer jun.s. 7 x 10. (*In his* Histoire générale des voyages. A Amsterdam: 1774. 21:456.) . IX

—— Wasserfall von Niagara. 7 x 10. (*In his* Allgemeine historie des reisen zu wasser und lande. Leipzig: Arkstee und Merkus. 1758. 16:684.) IX

Harris, William Richard. The Catholic church in the Niagara peninsula, 1626–1825. Toronto: W. Briggs. 1895. Pp. 123–126 V

Harris, William Tell. Remarks made during a tour through the United States of America in the years 1817, 1818, and 1819. Lond.: Sherwood, Neely and Jones, 1821. Pp. 164–168 III

Harrison, Jonathan Baxter. The condition of Niagara Falls, and the measures needed to preserve them. N. Y.: 1882 XI

—— The movement for the redemption of Niagara. (New Princeton rev., Mar., 1886. 1:233–245.) XI

Hartt, Mary B. Passing of Niagara. (Outl., May 4, 1901. 68: 21–28.) XI

Hartt, Rollin Lynde. New Niagara. (McClure, May, 1901. 17: 78–84.) X

Haskell, Daniel C. A partial bibliography of Niagara Falls. (Ann. rep'ts of the com'rs of the state reserv. at Niagara. Albany, 1913. 29:49–98.).

Haskel, Daniel *and* Smith, J. Calvin. Complete description and statistical gazetteer of the United States of America . . . N. Y.: Sherman and Smith. 1843. P. 472 V

Haskin, J. R. The electrical equipment of Mathieson alkali works. (Elec. wld., Nov. 27, 1897. 30:637–638.)

—— The Niagara Falls and Lewiston railway. (Elec. wld. June 5, 1897. 29:725.) X

Hatton, Joseph. Henry Irving's impressions of America; narrated in a series of sketches, chronicles, and conversations. Bost.: Osgood. 1884. Pp. 366–381 IV

Hatton, Joseph. Niagara illustrated. (Art jour. 1885. 37: 13–14.) IX

Hatton, R. S. *and* Petavel, J. E. High temperature electrochemistry — notes on experimental and technical electric furnaces. (Elec. rev. Jan. 3, 10, 1903. 42: 5–7, 45.)

Haupt, Herman. Long distance transmission of power. 2d ed. 13 William St., N. Y. n.d.

Haussonville, Gabriel Paul Othenin de Cleron, *Comte d'*. West Point et le Niagara. (Revue des Deux Mondes. 1882. Per 3. Tome 49. Pp. 821–832.)

Havell, Robert. Niagara Falls. Painted from the Chinese pagoda, Point view gardens. Sing Sing: 1845 IX

—— Panoramic view of the Falls of Niagara. 1846 IX

Hawley, Jesse. Memorial against ceding to the United States the right to construct the Niagara ship canal and in favor of retaining it as the property of the state. (N. Y. state sen. doc. 108. April 11, 1840.) XII

Hawthorne, Nathaniel. Fragments from the journal of a solitary man. (*In* Fanshawe, the Dolliver romance and other pieces. Boston: Osgood. 1876. Pp. 93–96.) III

—— My visit to Niagara. (*In* Fanshawe, the Dolliver romance and other pieces. Boston. Osgood. 1876. Pp. 105–114.) III

Hayes, George E. Remarks on the geology and topography of western New York. (Am. jour. of sci., Jan., 1839. 35: 86–105.) VII

Hayes, J. D. "The Niagara ship canal"; and "Reciprocity," papers written for the "Buffalo Commercial Advertiser"; together with the speech of Hon. Israel T. Hatch, in the convention at Detroit, July 14, 1865. Buffalo: Matthews and Warren. 1865. Pp. 1–21 XII

Hayes, James. A note on Niagara literature. (The bookworm. (Lond.:) 1891. 4: 337.) IX

Head, *Sir* George. Forest scenes and incidents, in the wilds of North America; being a diary of a winter's route from Halifax to the Canadas, and during four months' residence in the woods on the borders of Lakes Huron and Simcoe. Lond.: John Murray. 1829. Pp. 329–334. VI

Head, *Sir* Francis Bond. The emigrant. 5th edition. Lond.: John Murray. 1847. Pp. 205–218 III

Head works of the plant of the Toronto and Niagara power company, Niagara Falls. (Eng. rec., Apr. 8, 1905. 51: 405–406.)

Hearing at Niagara Falls (The). (Outl., July 21, 1906. 83: 632–633.) XI

Heath, James. (Eng.) The Falls of Niagara. (Grosvenor library, Buffalo, N. Y. Views of Niagara Falls. 1697–187–. Mat 3.) . IX

Help to save Niagara Falls. (Outl., Apr. 21, 1906. 82:865–866.) XI

Hennepin, Bibliography of. (Ann. rep'ts of the com'rs of the state reserv. at Niagara. Albany: 1893. 9:55–75.)

Hennepin, Louis. Carte d'une nouveau monde entre le nouveau Mexique et la Mer Glaciale. 11 x 18. (*In his* Nouveau voyage. A Utrecht. 1698.) IX

—— Carte d'un tres grand pays entre le Nouveau Mexique et la Mer Glaciale. 16½ x 20. (*In his* Nouveau voyage. A Utrecht. 1697.) IX

—— Carte d' une tres grand pais nouvellement découvert dans l'Amerique Septentrionale entre le Nouveau Mexique et la Mer Glaciale. 14½ x 17. (In his Nouveau voyage. A Utrecht. 1697.) IX

—— Chute d'eau de Niagara. 5 x 6½. (*In his* Nouvelle découverte d'un très grand pays situé dans l'Amérique. Utrecht: G. Broedelet. 1697. P. 44.) IX

—— Description de la Louisiane, nouvellement decouvérte au Sud 'Oüest de la Nouvelle France, par ordre du roy . . . A Paris. Chez la Veuve Sébastien Huré. 1683. Pp. 29–30 I

—— Description of Louisiana; translated from the edition of 1683 and compared with the *Nouvelle Découverte*, the La Salle documents, and other contemporaneous papers, by John Gilmary Shea. N. Y.: John G. Shea. 1880. Pp. 71–72, 378–381 I

[Hennepin, Louis.] A fac-simile view of Niagara Falls. (Grosvenor library, Buffalo, N. Y. Views of Niagara Falls. 1697–187–. Mat 1.) IX

Hennepin, Louis. Hennepin and variations. (Hennepin — First picture of Niagara Falls. Utrecht. 1697.) IX

—— A map of a new world between New Mexico and the frozen sea newly discovered by Father Louis Hennepin . . . (*In his* A new discovery of a country greater than Europe; situated in America, betwixt New Mexico and the frozen sea. Lond.: Bentley, Tonson, Bonwick, Goodwin & Manship. 1698.) IX

—— A new discovery of a vast country in America, extending above four thousand miles between New France and New Mexico; with a description of the great lakes, cataracts, rivers, plants, and animals . . . London. Printed for M. Bentley, J. Tonson, H. Bonwick, T.

Goodwin, and S. Manship. 1689. Pp. 24–25, 216–221, or, 29–30, 266–274 I

Hennepin, Louis. A new discovery of a vast country in America, by Father Louis Hennepin; reprinted from the second London issue of 1698, with facsimiles of original title-pages, maps, and illustrations, and the addition of introduction, notes, and index by Reuben Gold Thwaites . . . Chicago: A. C. McClurg. 1903. 1:54–55, 317–323....I

—— Nouvelle decouverte d'un tres grand pays Situé dans l'Amerique, entre Le Nouveau Mexique, et La Mer Glaciale, Avec les Cartes, & les Figures necessaires, & de l'Histoire Naturelle & Morale, & les avantages, qu'on en peut tirer par l'etablissement des colonies . . . A Utrecht. Chez Guillaume Broedelet. 1697. Pp. 44–46, 441–456.....I

Henry, Georges. Utilisation des chutes du Niagara. Etat actual des installations hydro-électriques. (Le Genre civil. June 17, 1899. 35:101–105.) X

Henry, Walter. Events of a military life; being recollections after service in the Peninsular war, invasion of France, the East Indies, St. Helena, Canada, and elsewhere. Lond.: Pickering. 1843. 2:220–227 III

Herbertson, Andrew J. The history of the great lakes and Niagara. (Knowl. Oct. 1, 1896. 19:223–224.).....VII

—— The history of the great lakes and Niagara. (Sci. Am. sup., Nov. 7, 1896. 42:17398.).....VII

Hereclia, Jose Maria. Address to the Niagara river. (*In* Barham, William, Descriptions of Niagara; selected from various travellers. . . . Gravesend. N.d. Pp. 174–175.).....VIII

Hering, Carl. Niagara Falls power plant. (Elec. wld., Feb. 6, 1892. 19: 85–86.).

Heriot, George. Travels through the Canadas, containing a description of the picturesque scenery on some of the rivers and lakes; with an account of the productions, commerce, and inhabitants of those provinces. . . . Lond.: Richard Phillips. 1807. Pp. 159–173.....III

—— View of the Falls of Niagara, from the bank near Birche's Mills and View of the Falls of Niagara from beneath the bank on the Fort Schlausser side. F. C. Lewis (sc.) Printed for Richard Phillips, London. (Grosvenor library. Buffalo, N. Y. Views of Niagara Falls. 1697–187–. Mat 6.).....IX

Herschel, Clemens. Niagara mill sites, water connections and turbines. (Cass. July, 1895. 8:227–250.).....X

—— Niagara turbines. (Cass., Mar., 1893. P. 387–389.)....X

Herschel, Clemens. Utilization of the Falls of Niagara. (Eng. news, Jan. 23, 1892. 27: 74–76.) X

Hervieu, A——. Indians at Niagara. (*In* Power, Tyrone, Impressions of America, during the years 1833, 1834, and 1835. Lond.: Richard Bentley. 1836. 1: 391–411.) IX

Hess, B——. The falls of Niagara, from the Canada side. 1859. IX

Hibernicus (DeWitt Clinton). Letters on the natural history and internal resources of the state of New York. N. Y.: Bliss and White. 1822. Pp. 144, 185–186, 198–210 VI

High tension transmission line construction. (Elec. wld., June 6, 1908. 51: 1222–1223.)

Hill, J. Henry. (Horseshoe Fall from Goat Island.) 1889 IX

Hill, Rowland F. Letter . . . relative to the international park or state reservation at Niagara Falls. Albany: Weed, Parsons & Co., ptrs. 1880.

Hill, S——. View of the Falls of Niagara. (Grosvenor library, Buffalo, N. Y. Views of Niagara Falls. 1697–187–. Mat 3.) . IX

Hine, E. Curtiss. A night on the Niagara. (*In his* The haunted barque, and other poems. Auburn: Derby. 1848. Pp. 67–70.) VIII

Historical writings of the late Orsamus H. Marshall relating to the early history of the west with an introduction by William S. Stone (The). Albany: Munsell's Sons. 1887. Pp. 421–425 V

History of the Great Lakes. Chicago: Beers. 1899. Vol. I. See index V

Hitchcock, Charles H. Story of Niagara. (Am. antiq., Jan. and Feb., 1901. 23: 1–24.) VII

—— The story of Niagara. (Ann. rep'ts of the com'rs of the state reserv. at Niagara. Albany: 1901. 17: 75–107.) VII

Hodgson, Adam. Letters from North America, written during a tour in the United States and Canada. Lond.: Hurst, Robinson and Co. 1824. 1: 342–359 III

Hoff, W. *and* Schwabach, F. North American railroads. N. Y. (1906.) P. 24 V

Holder, Thomas. A complete record of Niagara Falls and vicinage, being descriptive, historical and industrial . . . Niagara Falls: Published for the author. 1882 XII

Hole, Samuel Reynolds. A little tour in America. Lond. and N. Y.: E. Arnold. 1895. Pp. 171–185 IV

Holland, Elihu G. Niagara and other poems. N. Y.: Rudd and Carleton. 1861. Pp. 5–35.

Holley, George W. The falls of Niagara with supplementary chapters on the other famous cataracts of the world . . . N. Y.: Armstrong. 1883. Pp. 1–163 V

—— Niagara. (Scrib. Aug., 1876. 12: 462–478.) IV

—— Niagara, its history and geology, incidents and poetry . . . N. Y.: Sheldon. 1872. Pp. 125–128 ..... V and VI

—— The proximate future of Niagara in review of Professor Tyndall's lecture thereon. (Proc. A.A.A.S. (Aug., 1873.) 1874. 22: pt. 2, 147–155.) VII

Holley, John Milton. (Whittlesey, Charles, Early history of Cleveland, Ohio. Cleveland: Fairbanks, Benedict. 1867. Pp. 175–176.) II

Holley, Orville Luther. Chart of Niagara Falls, the shores and islands. 4½ x 2½. (*In his* The picturesque tourists. N. Y.: Disturnell. 1844. Opp. p. 174.) IX

—— Map of Niagara strait and parts adjacent. 5 x 3. (*In his* The picturesque tourists. N. Y.: J. Disturnell. 1844. Opp. p. 176.) IX

—— The picturesque tourist; being a guide through the northern and eastern states and Canada . . . N. Y.: J. Disturnell. 1844. Pp. 174–176 XII

Holley's Niagara and the other cataracts of the world. (Cent. Jan., 1883. 3: 472.) IV

Holloway, F. American Fall from the ferry, *and* The Horseshoe Fall from Table Rock. (Grosvenor library, Buffalo, N. Y. Views of Niagara Falls. 1697–187–. Mat 15.) IX

Homanno, J. B. Complissimae Regionis Mississippi; Seu Provincae Ludovicianae à R. P. Ludivico Hennepin Francise Miss. in Amerie que Septentrionale Anno 1687, detectae nunc Gallorum Coloniis et Actionum Negotiis toto Orbe celeberrimae. Nova Tabula edita á Jo. Bapt. Homanno S. C. M. Geographo Norimbergae. Cum Privilegis Sac. Cas. Mig. IX

Hooker, Samuel. [Handbill advertising himself as guide to Niagara Falls.] Buffalo: n.d. XII

Hopkins, G. M. Atlas of the vicinities of the cities of Niagara Falls, North Tonawanda and Buffalo, N. Y. Phila.: G. M. Hopkins. 1893 ..... IX and XII

Horner's Buffalo and Niagara Falls guide and encyclopedia of useful knowledge. Buffalo: Horner. 1874. Pp. 63–86..XI

"Horrible waste" at Niagara (The). (Lit. dig., Oct. 12, 1912. 45:618.) XI

Hottes, M——. Niagara Falls.....IX

Houghton, George W. Niagara. (*In his* Niagara, and other poems. Bost.: Houghton Mifflin. 1882. Pp. 1–28.).....VIII

Houston, *Mrs.* M. C. Hesperos; or, Travels in the west. Lond.: Parker. 1850. 1:122–139.....XI

Houston, Edwin J. Half a decade of progress in electricity and magnetism. (Cass., Feb., 1906. 29: 286–288.).....X

Hovey, H. C. Niagara river gorge and falls. (Sci. Am. sup., Sept. 11, 1886. 22:8917.).....VII

How the power companies beautify Niagara. (Ladies' home jour. Oct., 1906. 23:39.).....XI

How to save Niagara. (Sci. Am., July 1, 1905. 93:27.).

How to see Niagara . . . Buffalo and N. Y.: Matthews, Northrup and Co. 1876.....XII

Howells, William Dean. Avery. (*In his* Their wedding journey. Boston and N. Y.: Houghton Mifflin and Co. 1888. Pp. 139–141.) VIII

—— Niagara, first and last. (The Niagara book. N. Y., 1901. Pp. 236–269.) IV

—— Their wedding journey. Boston and N. Y.: Houghton Mifflin and Co. 1888. Pp. 119–171, 288–319.....VIII

—— Niagara revisited, twelve years after their wedding journey. (Atlan., May, 1883. 51: 598–610.).....VIII

Howison, John. Sketches of Upper Canada, domestic, local, and characteristic: to which are added, practical details for the information of emigrants of every class; and some recollections of the United States of America. Edinb., Lond.: 1821. Pp. 91–111.....III

Howitt, Emanuel. Selections from letters written during a tour through the United States in the summer and autumn of 1819 . . . Nottingham: J. Dunn. (1820). Pp. 128–132.....VI

Howland, *Mrs.* Sarah Hagard. Extracts from the tour of Sarah Howland, and some of the poetry, letters, and other papers preserved by her, together with some account of her family compiled by her great grandson, Howland Pell. [N. Y.?] 1890.....XII

Howland, William B. Niagara Falls and the hundred years of peace. (Indep. June 22, 1914. 78: 522–523.).....V

Hubbard, Elbert. Power; or The story of Niagara Falls . . . East Aurora, N. Y. 1914.....X

Hudson, T. S. A scamper through America, or, Fifteen thousand miles of ocean and continent in sixty days. Lond.: 1882. Pp. 230–237.XI

Hughes, Thomas. Vacation rambles. Lond.: Macmillan. 1895. Pp. 146–148 IV

Hulbert, Archer Butler. The Niagara river. N. Y. and Lond.: G. P. Putnam's Sons. 1908.....VII

Hulbert, Charles. Museum Americanum; or, Select antiquities of nature and art in America . . . Lond.: Whittaker. 1823. Pp. 147–149 V

Hulett, T. G. Every man his own guide to the Falls of Niagara, or, The whole story in a few words. By T. G. H., a resident at the Falls. 3d ed. . . . Buffalo: Faxon and Co. 1843.....XII

Humphrey, James M. Speech in the house of representatives, January 14, 1869, on bill no. 1212, to provide for the construction of ship-canal around the Falls of Niagara.....XII

Humphrey, Lucy H. *comp.* The poetic new-world. N. Y.: Henry Holt and Co. 1910. Pp. 334–342.....VIII

Hunter, William S. Hunter and Chisholm's panoramic guide from Niagara Falls to Quebec. Montreal: Chisholm. 1867. Pp. 1–18..XII

Hunter, William S., Jr. Hunter's panoramic guide from Niagara Falls to Quebec. . . . Boston: J. P. Jewett and Co. 1857. Pp. 1–18 XII

Huret, Jules. En Amerique: de San Francisco an Canada. Paris: Charpentier. 1905. Pp. 329–337.....IV

Hyatt, Alpheus. Rock ruins. [Niagara Falls] (Am. nat. April, 1869. 2:77–85.).....VII

Hydraulic features of the latest Niagara power plant. (Eng. news. Nov. 30, 1905. 54:577–578.).....X

Hydraulic features of the plant of the Niagara Falls power company, I. (Eng. rec., Nov. 21, 1903. 48:616–619.)....X

Hydraulic features of the plant of the Niagara Falls power company, II. (Eng. rec., Nov. 28, 1903. 48:652–655.)...X

Hydraulic features of the plant of the Niagara Falls power company, III. (Eng. rec., Dec. 5, 1903. 48:691–693)....X

Hydraulic features of the plant of the Niagara Falls power company, IV. (Eng. rec., Dec. 19, 1903. 48:763–767.)...X

Hydraulic features of Niagara power (The). (Elec. wld, Jan. 14, 1899.).....X

Hydro-electrc developments of the Ontario power company, I. (Elec. wld. & eng. Aug. 26, 1905. 46: 343–345.) X

Hydro-electric developments of the Ontario power company, II. (Elec. wld. & eng. Sept. 2, 1905. 46: 387–389.) X

Hydro-electric developments of the Ontario power company, III. (Elec. wld. & eng. Sept. 9, 1905. 46: 440–441.) X

Hymn of Niagara. (Choriambic.) (Putnam. May, 1868. 11: 538.) VIII

Ice bridge at Niagara (The). (Harp. w., Feb. 3, 1883. 27: 74, 76.) V

Illuminating the Niagara cataract by acetylene. (Elec. eng. June 30, 1897. 23: 747.)

Illustrated guide to Niagara Falls. Chic.: Rand, McNally & Co. 1884.

Importation of Electric power at Niagara. (W. elec. Mar. 2, 1907. 40: 189.)

Imrie, John. Niagara Falls. (*In his* Songs and miscellaneous poems. Toronto: Imrie and Graham. 1891. Pp. 26–28.) VIII

[Industrial development of Niagara Falls (The).] (Sci. Am., sup., Mar. 3, 1900. 49: 20207–20220.)

Industrie (L') Americaine fera-t-elle-disparatrie les chutes du Niagara. (Le tour du monde — a travers le monde. n.s. anée 12 [1906]. Paris: 1906. Pp. 289–292.) XI

(Ingraham, Duncan.) Extract from a letter from a gentleman upon his return from Niagara. (Buff. hist. soc. 15: 387–393; *or* O'Callaghan, E. B., Doc. hist. of the state of New York. Albany: Weed, Parsons and Co. 1849. 2: 1108–1110.) XII

—— Extract from a letter from a gentleman upon his return from Niagara. (Mass. hist. soc., 1792. 1: 287; *or* O'Callaghan: Doc. hist. of state of New York. Albany. 1849. 2: 1110.) II

Ingraham, John Wentworth. A manual for the use of visitors to the Falls of Niagara: Intended as an epitome of and temporary substitute for, a larger and more extended work, relative to this most stupendous wonder of the world. Buffalo: Charles Faxon. 1834.

Inspection of Niagara power tunnel. (Elec. wld. June 30, 1908. 51: 1319.)

Inspection of tunnels of the Niagara Falls power company. (Elec. rev. June 20, 1908. 52: 988.)

Institution of civil engineers at Niagara Falls, September 29, 1904 (The). Presented by the local committee of the Canadian society of civil engineers. Niagara Falls, Canada.....X

International joint commission. Rules of procedure of the International joint commission. Adopted pursuant to article XII of the treaty between the United States and Great Britain, signed January 11, 1909. Promulgated February 2, 1912. Wash.: Gov't print. off. 1912 XI

International Niagara commission. (Eng. rec., Feb. 28, 1891. 23: 204.)

International protection of Niagara Falls. (Sci. Am., Apr. 21, 1906. 94: 322.) XI

International topographical railroad guide between the Atlantic seaboard and the Missouri river. W. E. Tunis. Niagara Falls, N. Y.: M. Wallace. Chicago: 1856. Pp. 52–58 XII

International waterways commission. Documents relating to. (Ann. rep'ts of the com'rs of the state reserv. at Niagara. 19: app. 255–261.) XI

—— Message from the President of the United States transmitting the final report of international waterways commission upon the proposed dam at the outlet of Lake Erie. (63d Cong., 1st sess. Sen. doc. 118.) .....IX and X

—— Report of the American section to the secretary of war, December 1, 1908. (Ann. rep'ts of the com'rs of the state reserv. at Niagara. 25:17–24.) XI

—— Supplementary report. . . . 1909. Ottawa: C. H. Parmelee printer. 1909. (Canada sessional papers. No. 19c. 1910.)

—— (U. S. & Can.) Report upon the existing waterpower situation at Niagara Falls, so far as concerns the diversion of water on the American side, by the American members of the international waterways commission and Captain Charles W. Kutz, corps of engineers U. S. A. Wash.: Gov't print. off. 1906.....X

—— (U. S. & Can.) Second interim report of the Canadian section and first joint report of the commission. Ottawa: 1906.....X

International waterways commission organized. (Ann. rep'ts of the com'rs of the state reserv. at Niagara. 22:16–30.)...XI

Inverted Geyelin-Jonval turbines at Niagara Falls. (Eng. rec., Apr. 7, 1894. 29: 297.).....X

Itinerary to Niagara Falls, in 1809 (An). (Penn. mag. of hist. and biog. July, 1900. 24: 200–202.)

Izard, Ralph. An account of a journey to Niagara, Montreal and Quebec, in 1765; or "Tis eighty years since." N. Y.: Osborn. 1846. Pp. 5–13 II

J. V. C. (del.) View of Niagara river and Lake Ontario from the top of the mountain at Lewiston. Jewett, Thomas & Co. printers. (Grosvenor library, Buffalo, N. Y. Views of Niagara Falls. 1697–187—. Mat 16.) IX

Jackson, Moses. To America and back: a holiday run. Lond.: McCorquodale. 1886. Pp. 121–134 IV

James, Henry. Niagara, 1871. (*In his* Portraits of places. Boston. Osgood. 1884. Pp. 364–376.) XI

James, Thomas Horton. Rambles in the United States and Canada during the year 1845 . . . by Rubio. Lond.: John Olliver. 1846. Pp. 87–91.

James, William. Map of the straits of Niagara from Lake Erie to Lake Ontario. 7 x 15. (*In his* A full and correct account of the military occurrences of the late war between Great Britain and the United States. Lond.: For the author. 1818. 1: Frontispiece.) . IX

Jameson, *Mrs.* A. B. M. Winter studies and summer rambles in Canada. Lond.: Saunders and Otley. 1838. 1: 82–84. 2: 48–78 III

Jefferys, Thomas. Chart of the Atlantic ocean, with the British, French & Spanish settlements in North America, and the West Indies; as also on the coast of Africa. (*In his* General topography of North America and the West Indies. Lond.: Printed for Robert Sayer and Thomas Jefferys. 1768. No. 13.) IX

—— A map of Canada and the northern part of Louisiana with the adjacent countries. (*In his* The natural and civil history of the French dominion in North and South America. Lond.: 1760. Pt. I, Front.) IX

—— A map of Canada and the northern part of Louisiana with the adjacent countries. 11½ x 15. (*In* Mills, David, A report on the boundaries of Ontario. Toronto: 1873.) IX

Johnson, Clifton. Highways and by-ways of the Great Lakes. N. Y.: Macmillan. 1911. Pp. 38–54 V

Johnson, F. H. Every man his own guide at Niagara Falls without the necessity of inquiry or possibility of mistake; including the sources of Niagara, and all places of interest, both on the American and Canada side. . . . Rochester: D. M. Dewey. (1852) Pp. 1–93. XII

—— A guide for every visitor to Niagara Falls. Including the sources of Niagara, and all places of interest, both on the American and Canada side. . . . Buffalo: Phinney & Co. (1852) XII

—— Guide to Niagara Falls and its scenery. . . . Phila.: Childs. 1863 XII

—— Statistics of Niagara Falls and vicinity. . . . Buffalo: E. A. Maynard & Co. ptrs. 1848.

Johnson, Guy. Map of the country of the six nations. (*In* Pouchot, M. ——, Memoir upon the late war in North America. . . . Roxbury, Mass.: W. Elliot Woodward. 1866. 2:148.) IX

—— Map of the frontiers of the northern colonies with the boundary line established between them and the Indians at the treaty held by S. Will Johnson at Fort Stanwix in nov. 1768. (*In* O'Callaghan, E. B., Documentary history of the state of New York. Albany: 1850. 1:376.) IX

—— Map of the frontiers of the northern colonies with the boundary line established between them and the Indians at the treaty held by S. Will Johnson at Ft. Stanwix, in nov. 1768. (*In* Mills, David, A report on the boundaries of Ontario. Toronto: 1873.) IX

—— The country of the six nations proper, with part of the adjacent colonies. (*In* O'Callaghan, E. B., Documentary history of the state of New York. Albany: 1849. 4:660.) IX

Johnson, H. G. A map of Niagara river, four miles above and three miles below the Falls. (1849 c.) IX

Johnson, Richard Lewis. Apostrophe to Niagara. (*In his* Niagara; its history, incidents and poetry. . . . Wash.: Neale. 1898. Pp. 35–41.) VIII

—— Niagara: its history, incidents, and poetry. Wash.: Walter Neale. 1898 V

Johnson, Wallace C. A new development of power at Niagara. (Cass. Feb., 1894. 5:326–330.) X

—— Power development at Niagara Falls other than that of the Niagara power company. (Jour. ass'n eng. soc., Aug., 1899. 23: 78–90.) X

Johnson, Wallace C. The pulp mill of the Cliff paper company of Niagara Falls, New York, and discussion. (Trans. Am. S. C. E. Aug., 1894. 32: 214–230.) X

Johnston, Charles. A narrative of the capture, detention, and ransom of Charles Johnston of Botetout county, Virginia, who was made prisoner by the Indians on the river Ohio, in the year 1790: together with an interesting account of the fate of his companions, five in number, one of whom suffered at the stake. To which are added, sketches of Indian character and manners, with illustrative anecdotes. New York: J. and J. Harper. 1827. Pp. 87–88 V

Johnston, James Finlay Weir. Notes on North America; agricultural, economical and social. Bost.: C. C. Little and J. Brown. Edinb. and Lond.: W. Blackwood and Sons. 1851. 1: 247–258 VII

Johnston, W. —— and A. K. Quebec, Niagara, Montreal. 10 x 7½. (*In their* World-wide atlas of modern geography, etc. 5th ed. fol. Edinb. and Lond.: W. and A. K. Johnston. 1900. P. 116 IX

Johnstone, C. L. Winter and summer excursions in Canada. Lond.: Digby, Long, and Co. 1894. Pp. 206–207 IV

Joinville, F. F. P. L. M. d'O., *Prince de.* Memoirs, vieux souvenirs, of the Prince de Joinville; tr. from the French by Lady Mary Loyd. N. Y.: Macmillan. 1895. P. 116 III

Joliet, Louis. Nouvelle découverte de plusieurs nations dans la Nouvelle France en l'année 1673 et 1674. Gaston Morel lith. (Reduction facsimile). Imp. E. Cagniard à Rouen. 16 x 21½. (*In* Mag. of Am. hist. Ed. by John Austin Stevens. N. Y.: A. S. Barnes. 1882. 9: 273.) IX

—— Nouvelle découverte des plusieurs nations dans la Nouvelle France, en l'année 1673 et 1674. 21 x 15¾. (*In* Thwaites, R. G., Jesuit relations. Cleveland: Burrows Bros. 1900. 59: 86.) IX

Jordan, C. W. An account of a visit to the power plant of the Ontario power company at Niagara Falls. (Proc. inst. of mechanical engineers. January 7, 1910. 61: 53–87.)

—— The development of electrical power at Niagara Falls. (Nature. April 7, 1910. 83: 173–176.)

Joutel, Henri. Carte nouvelle de la Louisiane, et de la rivière de Mississippi, découverte par feu mr. de la Salle. . . . Dressée par le S'r. Joutel, qui etoit de ce Voyage. 1713. (*In his* Journal of La Salle's last voyage. . . . Chicago: The Caxton Club. 1896.) . . . IX

Joutel, Henri. Carte nouvelle de la Louisiane, et de la rivière de Mississippi, découverte par feu mr. de la Salle. Dressée par le S'r. Joutel qui etoit de ce Voyage. 1713. (*In his* Journal of La Salle's last voyage, 1684–7. . . . New ed. Albany: J. McDonough. 1906.) IX

—— A new map of the country of Louisiana and of ye river Missisipi in North America, discover'd by monsr de la Salle in ye years 1681 and 1686, as also of several other rivers before unknown. . . . By the Sr. Joutel, who perform'd that voyage. 1713. (*In his* Journal of the last voyage perform'd by Monsr. de la Salle. . . . Lond.: Printed for A. Bell. [etc.] 1714.) IX

Judah, T. D. (Civil engineer.) Map of the villages of Bellvue, Niagara Falls and Elgin. 30 x 42. Buffalo, N. Y.: Lith. of Compton and Gibson. [1854.] IX

Judson, William Pierson. From the west and northwest to the sea by the way of the Niagara ship canal. N. Y.: 1890.....XII

—— History of the various projects, reports, discussions and estimates for reaching the Great Lakes from tide-water, 1768–1901. N. p. N. d. Pp. 10–12.....XII

Kalm, Peter. Fac-simile from Kalm, A. D. 1750. "XX" Engraved for Ingraham's "Description of Niagara."....IX

—— A letter from Mr. Kalm, a gentleman of Sweden, now on his travels in America, to his friend in Philadelphia containing a particular account of the great fall of Niagara, September 2, 1750. (Gentleman's mag., Jan., 1751. 21:15–19.).....II, VI and IX

—— A letter from Mr. Kalm, a gentleman of Sweden, now on his travels in America, to his friend in Philadelphia, containing a particular account of the great fall of Niagara. (*In* Bartram, John, Observations on the inhabitants, climate, soil, rivers, productions, animals, and other matters worthy of notice . . . Lond.: Whiston and White. 1751. Pp. 79–94.).....II

[Kalm, Peter.] A view of the famous cataract of Niagara in North America. (Grosvenor library, Buffalo, N. Y. Views of Niagara Falls. 1697–187—. Mat 2.).....IX

Keller, *Major* Charles. Niagara river from above the Falls to Lake Ontario; prepared under the direction of Major Charles Keller, Corps of Engr's., U. S. Army, in 1909.....IX

Kellogg, E. B. *and* E. C. Niagara and its wonders. (Grosvenor library, Buffalo, N. Y. Views of Niagara Falls. 1697–187—. Mat 26.) IX

Kelsey, Richard. Niagara. Jephthah. Remarks upon the defense of Wessex by Alfred the Great; with other compositions, in verse and prose. Lond.: 1848.....VIII

Kelly, Christopher. A new and complete system of universal geography. Lond.: Kelly. 1819–1822. 1:548–549.....V

Kemble, Frances Anne. Records of a girlhood. N. Y.: Holt. 1879. Pp. 579–585.....III

Kennedy, William, Jr. Canadian water powers. With special reference to the utilization for electrical purposes. (British association for the advancement of science, Toronto meeting, 1897, Handbook of Canada.) Toronto: 1897. Chap. 8:385–387.).....X

Kent, William. Memoirs and letters of James Kent, late chancellor of the state of New York. Bost.: Little, Brown and Co. 1898. Pp. 154–156.....III

Kenyon, O. A. Utilization of Niagara Falls. (Elec. wld. & eng. June 3, 1905. 46:1038.).....X

Ketchum, William. An authentic and comprehensive history of Buffalo. . . . Buffalo: Rockwell, Baker, and Hill. 1864–1865. 1:51–55.....V

Keyes, Monroe James. Tourists' illustrated guide book to the islands, peninsulas, and cities of Lake Erie and Niagara Falls. Bucyrus, O.: News pub. co. 1899. Pp. 78–79.....XII

Kibbe, August S. Report of the survey to determine the crest lines of the Falls of Niagara in 1890, made under the direction of John Bogart, state engineer and surveyor. (Ann. rep'ts of the com'rs of the state reserv. at Niagara. Albany. 1891. 7:195–102.).....VII

Kingsbury, J. Addison. Pleasure and travel made easy. A better way to see old sights or new . . . Vol. I, Pittsburgh: Kingsbury. 1884.....XII

—— Pleasure travel made easy. A better way to see old sights or new. . . . Pittsburgh: (Allegheny Valley railroad company.) 1885.

Kingsmill, Thomas W. Time gauge of Niagara. (Nature. Aug. 9, 1894. 50:338.).....VII

Kingston, William H. G. Western wanderings, or, A pleasure tour in the Canadas. Lond.: Chapman and Hall. 1856. 1:265–311.XI

Kirkpatrick, John Ervin. Timothy Flint, pioneer, missionary, author, editor, 1780–1840. . . . Cleveland: Arthur H. Clark Co. 1911. Pp. 198–199.....III

Kitchin, Thomas. A map of the French settlements in North America. 7 x 7. (*In* the London mag. Lond.: for R. Baldwin. Dec., 1747. 16:opp. 543.) IX

—— North America, wherein are particularly distinguished the British dominions, the United States, and the adjacent Spanish territories. (*In* Mills, David, A report on the boundaries of Ontario. Toronto: 1873.) IX

Knight, S. S. The new twenty-five hundred horse power turbines at Niagara. (Sci. Am., Dec. 10, 1898. 79: 373–374.) X

Koch, Felix J. Fleecing tourists on the grand tour at much-threatened Niagara. (Overland mo., May, 1907. 49: 417–419.) XI

Koester, Frank. Hydro-electric developments and engineering. . . . N. Y.: D. Van Nostrand Co. 1909. (See index.) X

Kohl, J. G. Travels in Canada, and through the states of New York and Pennsylvania. Tr. by Mrs. Percy Sinnett. Rev. by the author. Lond.: Manwaring. 1861. 2:128–178 IV

Kollner, August. Rapids of Niagara, drawn from nature. Paris: Goupil.

Krausse —— *and* Eltiner —— (sc.). Eisenbahn Hängerbrücker über den Niagara. [1860?] (Grosvenor library, Buffalo, N. Y. Views of Niagara Falls. 1697–187—. Mat 17.) IX

Kroupa, B. An artist's tour; gleanings and impressions in North and Central America and the Sandwich Islands. Lond.: Ward and Downey. 1890. Pp. 327–330 XI

Kutz, *Capt.* Charles W. Reports upon the existing water power situation at Niagara Falls, so far as concerns the diversion of water on the American side, by the American members of the International waterways commission and Captain Charles W. Kutz, Corps of Engineers, U. S. A. Wash.: Gov't print. off. 1906 XI

La France, Joseph. A new map of part of North America from the latitude of 40 to 68 degrees. 12½ x 18½. (*In* Dobbs, Arthur, Remarks upon capt. Middleton's defence. Lond.: 1744. Opp. P. I.) IX

La Franchise, de. Le Sievr de la Franchise av discovrs Dv Sievr Champlain. (*In* Champlain, Samuel de, Des sauvages. . . . Paris. 1604.) VIII

La Lande, M. de la. Memoire sur la vie de M. Picquet, missionaire au Canada. (Lettrès édifiantes et curieuses, écrites des missions étrangères. Nonvelle edn. Paris: J. P. Merigot. 1783. Tome XXVI, p. 32.) I

La nouvelle fosse aux turbines de l'usine hydro-électrique de la Niagara Falls power company à Niagara Falls. (Le Genre civil. June 16, 1900. 37:123.).....X

La nouvelle usine hydro-electrique des chutes du Niagara. Le Genre civil. Jan. 3, 1903. 42:149–153.).....X

La Salle, Bibliography of. (Ann. rep'ts of the com'rs of the state reserv. at Niagara. Albany. 1893. 9:76–80.)

Lachian, *Major* R. Account of an extraordinary sudden fall in the waters of the Niagara river. (Can. jour. [Can. inst., ser. 1] Apr. 1855. 3:204–205.).....V

Lahontan, Louis Armand de Lom d'Arce, *baron de*. Nouveaux voyages de Mr. le Baron de Lahontan, dans l'Amerique Septentrionale; qui contiennent une Relation des différens Peuples qui y habitant; la nature de leur gouvernement; leur commerce, leurs coutumes, leur religion & leur maniere de faire la guerre . . . A la Haye, Chez les Fréres l'Honoré, 1703. 1:107.....I

—— New voyages to North America. Containing an account of the several nations of that vast continent . . . the several attempts of the English and French to dispossess one another . . . and the various adventures between the French, and the Iroquese confederates of England, from 1683–1694. A geographical description of Canada . . . Written in French by the Baron Lahontan . . . Done in English. . . . A great part of which was never printed in the original. London. Printed for H. Bonwicke, T. Goodwin, M. Wotton, B. Tooke, and S. Manship. 1703. P. 82.....I

—— New voyages to North-America, by the Baron de Lahontan; reprinted from the English edition of 1703, with facsimiles of original title-pages, maps, and illustrations, and the addition of introduction, notes, and index, by Reuben Gold Thwaites . . . Chicago: A. C. McClurg. 1905. 1:137.....I

Lake Erie dam suggested. (W. elec. Sept. 12, 1903. 33:197.)

Lambert de Saint-Croit, Alexandre. De Paris á San Francisco . . . Paris: Levy. 1885. Pp. 70–86.....IV

Langheim, F——. Daguerreotypes of Niagara. (1840?)....IX

Langhorne, Maurice. Water power at Buffalo. N. Y.: & [Wash.:] T. M. McGill & Co. (c1888.)

Langmuir, J. W. Address before the American civic association at its annual general meeting held in Providence, Rhode Island, 19th November, 1907. (Ann. rep'ts of the com'rs for the Queen Victoria Niagara Falls park. 1907. 22:app. B.).....XI

Langslow, Richard. A Niagara Falls tourist of the year 1817. (Pub. Buff. Hist. Soc. 5: 111–133.) XII

Lanier, Robert S. International aid for Niagara. (R. of R., Apr., 1906. 33: 432–439.) XI

[Large view of Terrapin tower and Horseshoe Fall.] (Grosvenor library, Buffalo, N. Y. Views of Niagara Falls. 1697–187–. Mat 27.) IX

Largest waterfall in the world (The). (R. of R., Apr. 1905. 31: 491.) V

Latest foolhardy feat (The). (Spec., July 17, 1886. 59: 950–951.) V

Latham, Henry. Black and white. A journal of a three months' tour in the United States. Lond.: Macmillan. 1867. Pp. 221–231 IV

Latrobe, Charles Joseph. Niagara. (*In* Barham, William, Descriptions of Niagara, selected from various travellers; with original additions. Gravesend. n. d. Pp. 105–111.) XI

Lattimore, S. A. [A letter on the advantages of state ownership.] (1st ann. rep't of the com'rs of the state reserv. at Niagara. Albany: 1886. Pp. 18–21.) XI

Laugel, Auguste. Les Etats-Unis pendant la Guerre (1861–1865). Paris: Germer Bailliere. 1866. Pp. 132–137.

Le Beau, C. Avantures du Sr. C. Le Beau . . . ou voyage curieux et nouveau, parmi les sauvages de l'Amerique Septentrionale. Dans le quel on trouvera une description du Canada. Amsterdam: Wytwerf. 1738. P. 348–357 VIII

Le Clerc, Sebastian. Chute de la Rivière de Niagara. Elie énléve dans un Char de Feu. Engraved about 1700 IX

——— (Elie énléve dans un Char de Feu.) Grosevenor library, Buffalo, N. Y. Views of Niagara Falls. 1697–187–. Mat 1.) IX

Le Clercq, Chrétien. Etablissement de la Foy dans le Nouvelle France, contenant l'Histoire des Colonies Françoises & des Découvertes qui s'y font faites jusque à present: avec une relation exacte des Expeditions & Voyages entrepris pour la Découverte du Fleuve Mississippi jusque au Golphe de Mexique . . . sous la conduite du Sieur de la Salle . . . A Paris. Chez Amable Auroy. 1691. Vol. II. Pp. 132–163 I

——— First establishment of the faith in New France . . . Translated by J. G. Shea. N. Y.: Shea. 1881. Vol. II. Pp. 102–126 I

Le Sueur, Ernest A. Commercial power development at Niagara. (Pop. sci. mo., Sept., 1894. 45:608–630.) X

—— Professor Forbes on "Harnessing Niagara." (Pop. sci. mo., Dec., 1895. 48:198–204.) X

League of American wheelmen. Eleventh annual meet, Niagara Falls, N. Y. August 25, 26, and 27, 1890. Niagara Falls bicycle club. Pp. 17–24 XII

Legend of the whirlpool. Buffalo, N. Y.: Press of Thomas & Co. 1840 VIII

Lescarbot, Marc. Histoire de la Novvelle France, contenant les navigations, découvertes, & habitations faites par les François és Indes Occidentales & Nouvelle-France souz l'aveu & authorité de noz rois tres-chrétiens . . . A Paris, chez Iean Milot. 1609. Bk. II, pp. 366, 381, 383 I

—— Histoire de la Nouvelle France, suivie des muses de la Nouvelle France. Paris: Edwin Tross. 1866. 2: 339, 341, 343 I

—— The history of New France . . . with an English translation, notes and appendices by W. L. Grant . . . and an introduction by H. P. Biggar . . . Toronto: Champlain Society. 1907. 2:135, 138, 139 I

Lespinasse, R. The great cataract illustrated, and complete guide to all points of interest at and in the vicinity of the Falls of Niagara . . . Chicago. R. Lespinasse. 1884 XII

—— ***ed.*** Notes on Niagara. Chicago: R. Lespinasse, 1883 V

Lessons from the Niagara power plant. (Eng. rec., Jan. 14, 1899. 39:147–48.)

Letson, Elizabeth J. Post-pliocene fossils of the Niagara river gravels. (Bul. of the N. Y. state museum. No. 45. 9: 238–252.) VII

Letter from Mr. Kalm, a Swedish gentleman, late on his travels in America, to his friend in Philadelphia; containing a particular account of the great fall of Niagara (A). Under date of Albany, Sept. 2, 1750. (Dodsley's ann. reg. 4th ed. Lond.: J. Dodsley. 1765. 2:388–394.)

Levasseur, A. Lafayette on Amérique en 1824 et 1825, ou, Journal d'un aux Etats-Unis. Paris: Baudouin. 1829. 2: 439–444 III

Leverett, Frank. Glacial formations and drainage features of the Erie and Ohio basins. (U. S. geol. surv. Wash.: Gov't print. off. 1902. Pp. 70–71.) VII

Lewis, George. Impressions of America and the American churches: from journal of the Rev. G. Lewis. Edinb.: Kennedy. 1845. Pp. 334–341 IV

Liancourt, la Rochefoucault, *Duke de.* Travels through the United States of North America, the country of the Iroquois, and upper Canada, in the years 1795, 1796, and 1797; with an authentic account of Lower Canada. 2 vols. Lond.: R. Phillips. 1799. 1: 221, 223, 224, 225 ..... II, VI and X

Lieber, Francis, *ed.* Letters to a gentleman in Germany, written after a trip from Philadelphia to Niagara. Phila.: Carey, Lea and Blanchard. 1834. Pp. 333–356 VII

Life history of Niagara (The). (Engineering, March 22, 1889. 47: 269–271.)

Light on the age of Niagara. (Pub. opin., Oct. 20, 1898. 25: 496.) VII

Lighting of the gorge at Niagara Falls (The). (Elec. rev., Sept. 22, 1897. 31: 141.)

Lillie, A. Canada: physical, economic, and social. Toronto: Maclear and Co. 1855. Pp. 65–67 V

Limits to the profitable development of water power. (Eng. news, Oct. 4, 1894. 32: 276–278.) X

Lincoln, Benjamin. Journal of a treaty held in 1793, with the Indian tribes north-west of the Ohio, by commissioners of the United States. (Mass. Hist. Soc. collec. 3d ser. 5: 122–125.) II

Lincoln, P. M. [Effects of lightning on the Niagara Falls and Buffalo transmission line.] (Eng. news, June 12, 1902. 47: 487–488.).

Lines written immediately on first beholding Niagara Falls, July, 1815. (*In* Western review and miscellaneous magazine. Lexington. 1819. 1: 127–128.) V

Liston, James Knox. Niagara Falls; a poem in three cantos . . . Toronto: Author. 1843 VIII

Local distribution at Niagara Falls. (Elec. wld. Feb. 20, 1897. 29: 267.)

Local distribution of the cataract power at Niagara Falls. (Elec. eng. Feb. 10, 1897. 23: 153.) X

Logan, James. Notes of a journey through Canada, the United States of America, and the West Indies. Edinb.: 1838. Pp. 138–140. . III

Logan, John D. Over-song of Niagara. (Can. mag., Sept., 1907. 29: 440.) VIII

Lombardo, Alberto. Los Estados-Unidos. (Notas y Episodios de Viaje.) Mexico. 1884. Pp. 176–182.....XI

Long *and* Long. Niagara power. Niagara shore real estate. [Buf., N. Y. c1891.].....X

Long, Elias A. An acre in the city. A brief treatise on land, millionaires, fortunes in real estate, Buffalo, Niagara power. No pub. n.d. Pp. 24–30.....X

—— Niagara as it is. A complete guide. N. Y.: Rural publishing co. 1892.....XII

—— Niagara power; the utilization of the world's greatest waterfall for power purposes . . . Buffalo: The Wemborne-Sumner Co. (1889.).....X

Long distance transmission record (The). (Elec. wld., May 2, 1908. 51: 888–889.).....X

Long transmission line in Ontario. (Power. Oct. 13, 1908. 29: 615.)

Longfellow, Henry W. Poems of places. Boston: James R. Osgood and Co. 1876–1879. 27:152–167.....VIII

Longfellow, S. Under the bridge at Niagara. (*In his* Hymns and verses. Bost.: Houghton Mifflin. 1894. Pp. 100–101.)...VIII

Lord, John C. The genius of Niagara. (*In his* Occasional poems. Buffalo: Breed and Lent. 1869. Pp. 19–22.).....VIII

Lord Kelvin's views on Niagara development. (W. elec. Aug. 21, 1897. 21:109.).....X

Lorne, John George Edward Henry Douglas Sutherland Campbell, *Marquis of*. Canadian pictures drawn with pen and pencil; with numerous illustrations from objects and photographs in the possession of and sketches by the Marquis of Lorne, Sydney Hall, etc., engraved by Edward Whymper. N. Y.: n.d. Pp. 66–69.....XI

—— The governor-general's reply to addresses from the royal academy and the Ontario society of artists, Toronto, June, 1883. (*In* Memories of Canada and Scotland: speeches and verses. Montreal: Dawson Brothers. 1884. Pp. 334–335.).....XI

—— Niagara. (*In his* Memories of Canada and Scotland; speeches and verses. Montreal: Dawson Brothers. 1884. P. 60.)....VIII

Lotter, Matthieu Albert. Carte nouvelle de l'Amerique Angloise contenant tout ce que les Anglois possedent sur le Continent de l'Amerique Septentrionale savoir le Canada, la Nouvelle Ecosse ou Acadie, les treize Provinces unies . . . avec la Floride. Gravée exactement d'après les determinations geographiques dernierement faites par Matthieu Albert Lotter à Augsburg.....IX

Loveman, Robert. Niagara. (*In his* Poems. Tuscaloosa: Burton. 1893. P. 17.) VIII

Lovett, Richard. United States pictures drawn with pen and pencil. Lond., N. Y., and Chicago. 1891. Pp. 130, 138–144 V

Lowry, Augustus N. Niagara. Revised edition. [1886 c.] .. VIII

Luken, Caspar. Niagara. (1697) IX

Lutard, Auguste. Aux États-Unis. Deuxième edition. Paris: Société d'éditions scientifiques. N. Y.: Brentano. 1896. Pp. 196–205 XII

Lyell, *Sir* Charles. Life, letters and journals of *Sir* Charles Lyell, Bart. Lond.: Murray. 1881. 2: 61 XI

—— A memoir on the recession of the Falls of Niagara. (Proc. Geol. Soc. of London. 1842. 3: 595–602.) VII

—— Principles of geology. Phila.: J. Kay. 1837. 1: 176–178. VII

—— Travels in North America, in the years 1841–2; with geological observations on the United States, Canada, and Nova Scotia. N. Y.: Wiley and Putnam. 1845. 1: 22–43 VII

M. A. Niagara: a poem. N. Y.: Seymour. 1822 VIII

M. K. Shooting the Falls. (Macmill., Nov., 1882. 47: 42–47.) VIII

McCann, John Earnest *and* Saltus, Francis S. Niagara. (McClure. Oct., 1894. 3: 436.) VIII

Macaulay, James. Across the ferry: first impressions of America and its people. Lond.: Hodder and Stoughton. 1871. Pp. 186–197. XI

Macauley, James. The natural, statistical and civil history of the state of New York. N. Y.: Gould and Banks. 1829. 1: 212–217 V

McCauslin, Robert. An account of an earthy substance found near the Falls of Niagara and vulgarly called the spray of the falls: together with some remarks on the falls. Trans. Am. Philos. Soc. 1793. 3: 17–24.) VII

McElroy, Samuel. Water power at Niagara Falls. (Sci. Am. sup. Nov. 14, 1885. 20: 8217–8218.) X

McFarland, J. Horace. Shall we make a coal pile of Niagara? (Ladies' home jour., Sept., 1905. 22: 19.) XI

McGuire, Michael. Thoughts on Niagara. (*In* Artman, William and Hall, L. V., Beauties and achievements of the blind. Dansville, N. Y.: Pub. for the authors. 1854. P. 363–365.) VIII

Mackay, Alexander. The western world; or, Travels in the United States in 1846–1847: exhibiting them in their latest development social, political, and industrial . . . 2d ed. Lond.: Richard Bentley. 1849. 3:116–131 IV

Mackay, Charles. Life and liberty in America; or, Sketches of a tour in the United States and Canada in 1857–8. Lond.: Smith, Elder. 1859. 1:75–99 IV

Mackenzie, Eneas. An historical, topographical, and descriptive view of the United States and of Upper and Lower Canada. Newcastle-upon-Tyne: Mackenzie and Dant. (1819.). Pp. 49–52.....V

McKenney, Thomas L. Sketches of a tour to the Lakes . . . Balt.: F. Lucas. 1827. Pp. 93–99.....III

McKinnon, Daniel. A tour through the British West Indies in the years 1802 and 1803, giving a particular account of the Bahama Islands. 2d ed. with an app. Lond.: for J. White by S. Woolmer. 1812. Pp. 282–286.....II

Maclay, William. Journal, ed. by Edgar S. Maclay. N. Y.: D. Appleton and Co. 1890. P. 190.....VII

Madan, H. G. Complementary colors at the Falls of Niagara. (Nature. Dec. 21, 1882. 27:174.).....VII

Maginn, M. E. Can the power of the Niagara Falls be economically and effectively utilized? If so, what inducement is there for capital? (Chicago. 1889.)

" Maid of the mist " shooting the Niagara rapids. (Harp. w., June 22, 1861. 5, no. 234:389.).....V

Maitland, Frederic William. Life and letters of Leslie Stephen. N. Y.: Putnam. 1906. Pp. 124–125.....IV

Mansfield, Lewis W. ***and*** **Hammond, Samuel H.** Country margins and rambles of a journalist. N. Y.: J. C. Denby. Bost.: Phillips, Sampson and Co. 1855. Pp. 278–281.....IV

Manufacture and development of carborundum at Niagara Falls. (Jour. soc. chem. ind., Mar. 31, 1897. 16:246.)

Map and section of canals and tunnel proposed by Cataract construction company. (Eng. news. May 17, 1890. 23: 462. May 24, 1890. 24:484.).....X

Map of North America with Niagara Falls inset of Kalm-Hennepin type. (Grosvenor library, Buffalo, N. Y. Views of Niagara Falls. 1697–187–. Mat 22.).....IX

Map of the British and French settlements in North America (A) (part the first). Containing Canada, Nova Scotia, Newfoundland, New England, part of New York, with the lakes, six nations, and all the countries westward in the same parallels so far as discover'd; exhibiting the just boundaries, and the French encroachments: laid down from authentic surveys. [1753]? (American maps, II, No. 10.) IX

Map of the British and French settlements in North America. 11 x 15. (*In the* Universal mag. Lond.: J. Hinton. 1755. 17:145.) IX

Map of the five great lakes with part of Pensilvania. New York, Canada and Hudson bay territories, etc. [anon.] 8½ x 10. (*In the* London mag. Lond.: For R. Baldwin. Sept., 1755. 24: opp. 432.) IX

Marcou, Jules. Le Niagara quinze ans après. (Extrait du Bulletin de la Société-Géologique de France. 2e série. XXII. P. 190. 6 Mars. 1865.) VII

Marjoribanks, Alexander. Travels in South and North America. Lond.: Simpkin, Marshall, and Co. 1853. Pp. 266–275 IV

Marryat, Frederick, *Captain*. Diary in America, with remarks on its institutions. Lond.: Longman, Orme, Brown, Green, and Longman. 1839. 1:159–165 III

Marsh, Luther R. Niagara's emancipation. Remarks of Mr. Luther R. Marsh, November 3, 1885, before the New York historical society, on reporting to it, as one of its committee, appointed to attend the opening ceremonies at the inauguration of the Niagara Reservation, July 15, 1883. New York: Martin B. Brown. 1885 XI

Marshall, Charles. The Canadian dominion. Lond.: Longmans Green. 1871. Pp. 76–92 .....IV and XI

Marshall, Orsamus H. First visit of de La Salle to the Senecas made in 1669. No. imp. Pp. 31–32 V

Marshall, O. H. The Niagara frontier, embracing sketches of its early history, and Indian, French and English local names; read before the Buffalo historical club, Feb. 27, 1865. (*In* Buffalo Hist. Soc. pub., 1880. 2: 395–429.) V

Marshall, W. G. Through America; or, Nine months in the United States. Lond.: Sampson, Low, Marston, Searle, and Rivington. 1881. Pp. 71–84 XI

[Marston, Frank.] Frank's ranche . . . Bost.: Houghton Mifflin. 1886. Pp. 76–81 VIII

Martin, Robert Montgomery. British colonies; their history, extent, condition and resources. Lond. and N. Y.: J. and S. Tallis. (1850?). Div. I, pp. 74–75 V

Martin, Thomas Commerford. Niagara on tap. (Jour. Frank. inst., Oct., 1896. 142:287–302.) X

—— Niagara on tap. (Jour. Frank. inst., Nov., 1896. 142:354–366.) X

—— The utilization of Niagara. (Ann. rep'ts Smith. inst., 1896. 51: pt. 1, 223–232.) X

—— The utilization of Niagara. (Printed in Proc. of Royal inst. of Gt. Br. 15:269–279.) X

Martineau, Harriet. Retrospect of western travel. Lond.: Saunders and Otley. 1838. 1:96–109 III

Mather, J. H. *and* Brockett, L. C. A geographical history of the state of New York. Utica: Fuller. 1851. Pp. 348–349 V

[Mathews.] A summer month; or, Recollections of a visit to the Falls of Niagara, and the lakes. Phila.: H. C. Carey and I. Lea. 1823. Pp. 65–81 III

Mathews, Catharine van Cortlandt. Andrew Ellicott, his life and letters. N. Y.: Grafton. 1908. Pp. 72–76 IX

Matthews, Northrup & Company. A little guide to Niagara Falls . . . and a program for a two weeks' visit, by an old resident. Buffalo: Matthews, Northrup and Co. 1890.

Maude, John. Visit to the Falls of Niagara, in 1800. Lond.: Longman, Rees, Orme, Brown and Green. 1826. Pp. 131–165 ..... II, IX and XII

Maverick, Peter (sc.) Niagara from below. (Grosvenor library, Buffalo, N. Y. Views of Niagara Falls. 1697–187–. Mat 8.) . IX

Maxwell, Archibald Montgomery. A run through the United States during the autumn of 1840. Lond.: Henry Colburn. 1841. 1:260–287; 2:1–10 III

Meadows, J. From the stone tower at Niagara. (Lit. liv. age. Aug. 11, 1855. 46:351.) V

Meagher, William. A visit to the Falls of Niagara. (Irish mo. May, 1879. 7:271–274.).

Medley, Julius George. An autumn tour in the United States and Canada. Lond.: H. S. King. 1873. Pp. 86–88 XI

Meister, Wilhelm. Creation's pride. (*In* Johnson, R. L., Niagara, its history, incidents, and poetry. Wash.: W. Neale. 1898. P. 55.) VIII

Melish, John. Travels in the United States of America, in the years 1806 & 1807, and 1809, 1810, & 1811. . . . Phila.: T. and G. Palmer. 1812. 2:318–323.....III and XII

—— View of the country round the Falls of Niagara. J. Vallance. (sc.) 6½ x 4. (*In his* A military and topographical atlas of the United States, including the British possessions and Florida: (etc.) Phila.: G. Palmer. 1813. Opp. p. 11.).....IX

—— View of the country round the Falls of Niagara. 6½ x 4. (*In his* Travels through the United States. Phila.: G. Palmer. 1815. 2: opp p. 318.....IX

—— View of the country round the Falls of Niagara. 6½ x 4. (*In his* Geographical description of the United States with the contiguous countries including Mexico and the West Indies. New ed. Phila.: By the author. 1822. P. 138.).....IX

Mellen, Greenville, *ed.* Book of the United States . . . N. Y.: Smith. 1839. Pp. 63–67.....V

Memorandum concerning the jurisdiction, powers and proceedings of the commissioners of the state reservation at Niagara with respect to the preservation of the Falls and scenery of Niagara. (Ann. rep'ts of the com'rs of the state reserv. at Niagara. 21:59–80.).....XI

Meredith, E. A. The Queen Victoria Niagara Falls Park. (Can. mag., July, 1897. 9:228–239.).....XI

Merrill, Frederick J. H. A guide to the study of the geological collections of the New York state museum. (Bul. of the N. Y. state museum. Nov., 1898. 4: No. 19. Albany: 1898. See index) . VII

Merritt, J. P. Canada seventy years ago, or Prince Edward's visit to Niagara. 3d ed. St. Catharines, Ont.; 1860.....VIII

Mershon, Ralph D. High voltage measurements at Niagara. (Trans. Am. inst. elec. engrs., Atlantic City. June 30, 1908. 27, pt. II: 845–929.)

—— Losses and critical voltages of high tension transmission lines. (Eng. dig., Sept., 1908. 4:256–257.).....X

—— The transmission plant of the Niagara, Lockport and Ontario power company. (Trans. Am. inst. elec. engrs., N. F. June 26, 1907. 26 pt. II:1273–1317.).....X

Metz, ——. (del.) The Falls of Niagara. Heath. (sc.) Published as the act directs by Harrison & Co. April, 1783.....IX

Meursium, Jacobum. Novissima et accuratissima totius Americae descriptio per Jacobum Meursium. 17 x 20. (*In* Montanus, Arnoldus, De nieuwe en onbekende wereldt. Amsterdam: J. Meurs. 1671. Frontispiece.) IX

Michigan Central Railroad company. From city to surf . . . "The Niagara Falls route." Chicago: Rand, McNally. 1888. Pp. 1–78 XII

—— General passenger department. Niagara Falls. Chicago: Rand, McNally. 1901 XII

—— Niagara Falls. Chicago. 1902.....XII

—— Niagara Falls from different points of view. Chicago: Knight Leonard and Co. 1895.....XII

—— Niagara Falls from many points of view. Chicago: Knight Leonard and Co. N.d.....XII

—— Niagara Falls in miniature. Chicago: Rand, McNally. 1896 XII

Middle States: a handbook for travelers (The). . . . Bost.: Osgood. 1881. Pp. 177–184.....XII

Middleton, Charles Theodore. The great cataract or waterfall of Niagara in North America. 6½ x 10½. (*In his* A new and complete system of geography. fol. Lond.: For J. Cook. 1779. 2:505.) IX

Mignot, Louis R. Niagara. (A painting.) 1893.....IX

Milbert, J. Chûte du Niagara prise du côté Américain. Deroy, Lith. (*In* Milbert J., Itineraire pittoresque du Fleuve Hudson et des parties laterales l'Amerique du Nord d'aprés les dessins originaux pris sur les lieux. Paris: chez Henry Gaugain et Cie. Editeurs. No. 36.) . .IX

—— Chûte général du Niagara, côté du Canada. Adam et Jacottet Lith. (*In* Milbert, J., Itineraire pittoresque du Fleuve Hudson et des parties laterales l'Amerique du Nord d'après les dessins originaux pris sur les lieux. Paris: chez Henry Gaugain et Cie. Editeurs. No. 35.) IX

—— Fer à cheval de la chûte du Niagara côté de Canada. Sabatier, Lith. (*In* Milbert, J., Itineraire pittoresque du Fleuve Hudson et des parties laterales l'Amérique du Nord d'après les dessins originaux pris sur les lieux. Paris: chez Henry Gaugain et Cie. Editeurs. No. 34.) IX

—— Itinéraire pittoresque du fleuve Hudson et des parties latérales de l'Amérique du Nord, d'après les dessins originaux pris sur les lieux. Paris: Henri Gaugain et Cie. 1:187–204.....III

Milbert, Jacques-Girard. Cascata del Niagara *and* Saut du Niagara. Myon. (sc.) (Grosvenor library, Buffalo, N. Y. Views of Niagara Falls. 1697–187–. Mat 8.) IX

Miles, Hiram. Address before the assembly committee on commerce. March 6, 1866. XII

Miller, Crosby. Niagara Falls, No. 2. View of the Horseshoe Fall from Goat Island. Published by O. G. Steele. Buffalo: 1838. IX

[Minot, *Mrs.*]. Sketches of scenery on Niagara river. (N. Am. rev. Mar., 1816. 2: 320–329.) V

Misner, Charles E. My experience on the great ice bridge in the gorge of the Niagara river at Niagara Falls, January 22, 1899. (Home mag., Mar., 1899. 12: 239–242.) V

Mitchill, Samuel L. A summary of remarks made on the Falls of Niagara, by the Hon. Samuel L. Mitchill, as gathered from his conversations and display of mineral specimens. (The Portfolio, Sept., 1809. 2: 231–237.) VII

Mix, Ebenezer. Tragedy of the Devil's Hole. (Seaver, life of Mary Jemison, De-he-wa-mis. 4th ed. N. Y. and Auburn. 1856. App. I, pp. 273–277.) V

M'Jilton, J. N. Niagara. (*In his* Poems. Bost.: Otis, Broaders. 1840. Pp. 112–115.) VIII

Moll, Herman. A catalogue of a new and compleat atlas or set of twenty-six two-sheet maps. All composed and done according to the newest and most exact observations, by Herman Moll, geographer. (Buf. Hist. Soc.) IX

—— A map of New France containing Canada, Louisiana, etc., in North America according to the patent granted by the King of France to Monsieur Crozat, dated the 14th of September, 1712, N. S. and registered in the Parliament of Paris the 24th of the same month. (*In his* Atlas geographicus: or compleat system of geography (ancient and modern), for America. Savoy. Eli Nutt for John Nicholson. 1717. 5: 676.) IX

—— Map of North America according to ye newest and most exact observations . . . [1712.] (Maps of America. 1: No. 26.) .. IX

—— A new & correct map of the whole world. 1719. (*In his* The world described. fol. Lond.: 1710–1720. No. 2.) IX

—— A new and exact map of the dominions of the King of Great Britain on ye continent of North America . . . according to the newest and most exact observations. (*In his* The world described. fol. Lond.: 1710–1720. No. 8.) IX

Moll, Herman. A new and exact map of the dominions of the King of Great Britain on ye continent of North America, containing New Foundland, New Scotland, New England, New York, New Jersey, Pennsilvania, Maryland, Virginia, and Carolina. According to the newest and most exact observations. Dedicated to the Honourable Walter Douglas. 1715 IX

—— A new and exact map of the dominions of the King of Great Britain on ye continent of North America . . . according to the newest and most exact observations. [1730]? (Maps of America. 1: No. 12.) IX

—— To the Right Honourable John Lord Sommers, Baron of Evesham in ye county of Worcester, President of Her Majesty's most honourable Privy Council, etc. This map of North America according to ye newest and most exact observations is most humbly dedicated by your lordship's most humble servant. (Buf. hist. soc.) IX

Monck, Frances Elizabeth Owen Cole. My Canadian leaves, an account of a visit to Canada in 1864–1865. Lond.: Bentley. 1891. Pp. 159–170 IV

Money-making power of Niagara. (Outlook. June 23, 1906. 83: 483–484.).

Montule, Edouard de. A voyage to North America, and the West Indies in 1817. Lond.: Phillips. 1821. Pp. 92–95 . . III and IX

Moodie, *Mrs.* Susanna Strickland. Life in the clearings. Lond.: R. Bentley. 1853. Pp. 330–371 XI

Moore, George. Journal of a voyage across the Atlantic; with notes on Canada and United States . . . in 1844. Lond.: Printed for private circulation, 1845. Pp. 59–62 IV

Moore, Thomas. Memoirs, journal & correspondence of Thomas Moore; ed. by Lord John Russell. Lond. Longman, Brown, Green and Longman's. 1853. 1:169–173 III

—— Life and death of Lord Edward Fitzgerald. Lond.: Longman, Rees, Orme, Brown and Green, 1831. Pp. 144–145 II

—— To the honourable W. R. Spencer. (*In his* Poetical works. N. Y.: D. Appleton and Co. 10 vol. 1853. 2: 313–319.) . . VIII

—— To the Lady Charlotte Rawdon. (*In his* Poetical works. N. Y.: D. Appleton and Co. 10 vol. 1853. 2: 325–335.) VIII

More aspects of conservation. (Metal. & chem. eng. Mar., 1913. 11:117–118.) X

More leaves from Mr. Keeley's journal. (Colburn's new mo. mag., 1838. 53:191–197.....III

[Moreton, *Mrs.* C. J.] Niagara above the cataract. (*In her* Miscellaneous poems . . . [Phila.:] Porter and Coates. 1875. Pp. 165–169.) VIII

—— Niagara below the cataract. (*In her* Miscellaneous poems . . . [Phila.:] Porter and Coates. 1875. Pp. 165–169.).....VIII

Morley, John. Life of Richard Cobden. Lond.: Chapman and Hall. 1882. Pp. 6–7.....III

Morpeth, George William Frederick Howard, *Lord*. Niagara Falls. (*In* Holley, G. W., Niagara; its history and geology, incidents and poetry . . . N. Y. Buffalo, Toronto: 1872. P. 172.)..VIII

Morris, Charles. Niagara Falls and the Thousand Islands. (Half hours of travel at home and abroad. Phila.: Lippincott. 1896. 1:27–31.) V

Morris, William. Letters sent home. Out and home again by way of Canada and the United States; or, What a summer's trip told me of the people and the country of the great West. Lond.: F. Warne. N. Y.: Scribner, Welford and Armstrong. (1875). Pp. 202–235.....IV and XI

Morse, Jedidiah. The American gazetteer . . . 2d ed., corrected. Bost.: S. Hall. 1797.....V

—— ***and* Richard C.** A new universal gazetteer, or geographical dictionary . . . 3d ed. rev. and corrected. New Haven: S. Converse. 1821. P. 531.....V

—— The traveler's guide or pocket gazetteer of the United States. New Haven: Nathan Whiting. 1823.

—— ***and* Morse, Sidney Edwards.** Geography made easy . . . 22d ed. Bost.: Richardson and Lord. 1890. P. 84.

Morse, *Mrs.* S. D. Greater Niagara. Tourist's edition. Niagara Falls: 1896 XII

Most surprising cataract of Niagara in Canada (The). Engraved for Millar's New and complete and universal system of geography. (Grosvenor library, Buffalo, N. Y. Views of Niagara Falls. 1697–187–. Mat 3.).....IX

Mullin, E. H. The city of the future. (Cass. Nov., 1897. 13:27–30.).

Munger, Gilbert. Niagara Falls. (Painting.)

Munro, J. Electricity from Niagara. (Chambers' jour., Mar. 25, 1893. 70:177–180.) X

Munro, J. Electricity from Niagara. (Liv. age. May 27, 1893. 197: 567–571.).

Munro, Robert. A description of the Genesee country in the state of New York. New York; Printed for the author. 1804. (O'Callaghan, Doc. hist. of the state of New York. 2:1177.) III

Murray, Amelia M. Letters from the United States, Cuba, and Canada. New York: Putnam & Co. 1856. Pp. 109–115 ... XI

Murray, Charles Augustus. Travels in North America during the years 1834, 1835, and 1836. Including a summer residence with the Pawnee tribe of Indians in the remote prairies of the Missouri, and a visit to Cuba and the Azore Islands. Lond.: Richard Bentley. 1839. 1:81–87 III

Murray, Hugh. The encyclopedia of geography . . . revised, with additions, by Thomas G. Bradford. Phila.: Cary, Lee and Blanchard. 1837. 3:366 V

Music of Niagara. (Scribner's mo. June, 1881. 22: 307–308.) VIII

Nash, Wallis. Oregon; there and back in 1877 . . . Lond.: Macmillan and Co. 1878. Pp. 264–271 IV

National commercial convention, Detroit, Mich. Dec. 13, 1871. Proceedings of the National commercial convention to consider the question of increased transportation facilities from the West to the seaboard, held in Detroit, December 15 (i. e. 13), 1871. Published by order of the convention. Detroit: The Daily Post book and job printing establishment. 1872 XII

National society of colonial dames of America. Preservation of Niagara Falls. (Washington: Gov't print. off. 1906.) XI

National ship-canal convention. Proceedings of the convention held at the city of Chicago, June 2 and 3, 1863. Chicago: Tribune Co. 1863. Pp. 111–114 XII

Natural scenery and power development at Niagara Falls. (W. elec. July 18, 1903. 33:38.)

Neal, John. (O'Cataract, Jehu.) Battle of Niagara, a poem, without notes, and Goldau, or the Maniac harper. Baltimore: N. G. Maxwell. 1818. Pp. 67, 72–73 VIII

—— Wandering recollections of a somewhat busy life; an autobiography. Bost. Roberts Bros. 1869 V

Nelson, T. and Sons. The Falls of Niagara; being a complete guide to all the points of interest around and in the immediate neighborhood

of the great cataract; with views taken from sketches by Washington Friend and from photographs. Lond.: Nelson. 1860.....XII

Nethercut, Mary Bell. Niagara Falls; a bibliography. (University of Wisconsin, Library School. Madison, Wis.: June, 1913.)

New album of Niagara Falls, N. Y. Portland, Me.: Chisholm Bros. (1891?)

New aluminum producing plant for the Pittsburgh reduction company. (Eng. news, Oct. 24, 1895. 34: 275.)

New and accurate map of the English empire in North America (A), representing their rightful claim as confirm'd by charters, and the formal surrender of their Indian friends; likewise the encroachment of the French, with several forts they have unjustly created therein. By a Society of anti-gallicans. Sold by W. Herbert and Robert Sayer. Lond.: 1755. (American maps, II, No. 21.).IX

New bridge at Niagara Falls as it looks now (The). (Illus. Am. Sept. 23, 1898. 24: 233.).....XII

New cave of the winds (A). (Eng. (Lond.:) April 3, 1903. 95: 345.).....V

New guide to Niagara, with descriptions of its scenery, casualties, narrow escapes, etc. Niagara Falls: Gazette printing establishment. 1877.....XII

New hydraulic works at Niagara Falls (The). (R. R. gaz. Dec. 23, 1892.).....X

New installation at Niagara Falls. (Elec. rev., Mar. 26, 1897. 40: 427.)

New map of North America from the latest discoveries (A). 1763. (anon) 11 x 15. (*In* the London mag. Lond.: For R. Baldwin. Feb., 1763. 32: opp. 64.).....IX

New map of North America, with the West India islands (A). Divided according to the preliminary articles of peace, signed at Versailles, 2 Jan. 1783, wherein are particularly distinguished the United States and the several provinces, governments, etc. which compose the British dominions, laid down according to the latest surveys, and corrected from the original materials, of Governor Pownall, member of Parliament. Lond.: Laurie & Whittle. May 12, 1794.IX

New map of North America, with the West Indies (A) . . . Laid down according to the latest surveys, and corrected from the original material of Governor Pownall. Lond.: Laurie and Whittle. 1794. (American maps, II, No. 36–39.).....IX

New Niagara (The). Harp. w., Jan. 3, 1903. 47:11, 31.) . .X

New Niagara power canal. (Sci. Am., June 13, 1903. 88: 444.)

New power transmission line (The). (Eng. news, Jan. 17, 1901. 45: 41.) X

New projects at Niagara. (W. elec. Nov. 6, 1897. 21: 260.)

New railroad bridge at Niagara (The). Railroad gaz. April 24, 1896. 28: 281–282.)

New turbines for the Niagara Falls power company (The). (Eng. rec., Nov. 23, 1901. 44: 500–501.)

New uses for Niagara power. (Elec. eng. June 23, 1897. 23: 729.) X

New water power development below Niagara Falls (The). (Eng. news, Mar. 26, 1896. 35: 201.) X

New wheelpit of the Niagara Falls power company (The). (Eng. rec., Feb. 16, 1901. 43: 150–151.) X

New York Central and Hudson River Railroad Company. Two days at Niagara Falls. [Four track ser., no. 9.] XII

New York Central and Hudson River Railroad, passenger department. Health and pleasure on "America's greatest railroad." ("Four-track series.") Pp. 159–162 XII

New York Central and Hudson River Railroad Company. What can I see? and how much will it cost me in two days at Niagara Falls? . . . N. Y., N. Y. C. and H. R. R. R. Co., [1894] . .XII

New York Central Railroad. Two days at Niagara Falls. Published by the passenger department of "America's greatest railroad." 1896 XII

New York hydro-electric development. (Metal. & chem. eng. June, 1913. 11: 306.) X

New York hydro-electric development and Niagara Falls. (Metal. & chem. eng. July, 1913. 11: 370–371.) X

New York (State) — Citizens. Petition of citizens of the state of New York in relation to Niagara Falls. (New York State. Assembly doc. 1883. 3: No. 47.)

New York (State).— Commissioners of the state reservation at Niagara Falls. Application of the commissioners of the state reservation at Niagara, on behalf of the state of New York, to acquire lands in the village of Niagara Falls. Niagara Falls, N. Y.; Gazette office. 1884.

New York (State). Supplemental report of the commissioners of the state reservation at Niagara. Transmited to the Legislature Jan. 31, 1887. Albany: Argus Co. 1887.

New York (State) constitutional convention, 1894. Revised record of the constitutional convention of . . . New York, May 8, 1894, to September 29, 1894. Rev. by W. H. Steele. Albany, N. Y.: The Argus Printing Co. 1900.....XI

New York (State) Legislature. An act concerning the Niagara Falls power company. (Laws of 1893. 116th sess. Chap. 477: 973.) XI

—— An act confirming and defining certain riparian rights of the Niagara Falls hydraulic power and manufacturing company. (Laws of 1896. 119th sess. Chap. 967:1393.).....XI

—— An act for opening the navigation between Lake Erie and Lake Ontario, passed April 5, 1798. (Laws of 1798. Chap. 93.)..XII

—— An act to amend chapter 707 of the laws of 1893 entitled "An act to incorporate the Model town company, to define its rights, powers and privileges and for other purposes." (Laws of 1894. 117th sess. Chap. 605: 1370.).....XI

—— An act to amend the public lands law, by including certain lands of the state as a part of the state reservation at Niagara. (Laws of 1905. 128th sess. Chap. 508:1166.).....XI

—— An act to amend the public lands law, in relation to sewer through lands of the state reservation at Niagara. (Laws of 1908. 131st sess. Chap. 243: 702.).....XI

—— An act to amend the public lands law relative to constructing and operating water main along the lands of the state reservation at Niagara. (Laws of 1912. 135th sess. Chap. 236: 451.).....XI

—— An act to authorize the selection, location and appropriation of certain lands in the village of Niagara Falls for a state reservation and to preserve the scenery of the Falls of Niagara. (Laws of 1883. 106th sess. Chap. 336: 603.).....XI

—— An act to incorporate the Buffalo and Niagara power and drainage company. (Laws of 1889. 112th sess. Chap. 366: 484.)..XI

—— An act to incorporate the Lewiston water supply company in Niagara county, New York. (Laws of 1888. 111th sess. Chap. 561: 918.) XI

—— An act to incorporate the Lockport water supply company. (Laws of 1886. 109th sess. Chap. 106:187.).....XI

New York (State) Legislature. An act to incorporate the lower Niagara river power and water supply company. (Laws of 1902. 125th sess. Chap. 539: 1288.) XI

—— An act to incorporate the Model town company, to define its rights, powers and privileges and for other purposes. (Laws of 1893. 116th sess. Chap. 707:1753.) XI

—— An act to incorporate the Niagara canal company. (Laws of 1823. Chap. 132.) XII

—— An act to incorporate the Niagara county irrigation and water supply company. (Laws of 1891. 114th sess. Chap. 259. P. 483.) XI

—— An act to incorporate the Niagara, Lockport and Ontario power company. (Laws of 1894. 117th sess. Chap. 722. P. 1806.) . XI

—— An act to incorporate the Niagara river hydraulic company. (Laws of 1853. Chap. 116.) XI

—— An act to incorporate the Niagara river hydraulic tunnel power and sewer company of Niagara Falls, New York. (Laws of 1886. 109th sess. Chap. 83. P. 123.) XI

—— An act to incorporate the Niagara ship canal company. (Laws of 1853. Chap. 595.) XII

—— An act to provide for the maintenance and management of the state reservation at Niagara. (Laws of 1885. 108th sess. Chap. 286. P. 490.) XI

—— An act to provide for the payment of the awards made for the lands selected and located by the commissioners of the state reservation at Niagara. (Laws of 1885. 108th sess. Chap. 182. P. 337.) . . XI

—— An act relating to the Niagara Falls power company. (Laws of 1892. 115th sess. Chap. 513. P. 1041.) XI

—— Joint committee on conservation and utilization of water power. Report transmitted to the legislature Jan. 30, 1912. Albany: the Argus Co. 1912. (See index.)

—— Water supply commission. . . . Studies of water storage for flood prevention and power development in New York state under public ownership and control. Progress report under chap. 569, Laws of 1907, transmitted to the governor and legislature Feb. 1, 1908. . . . Albany: J. B. Lyon. 1908.

New York (State). Memorial of the citizens of New York, in favor of a canal navigation between the great western lakes and the tide-waters of the Hudson. (Pub. Buf. Hist. Soc., Vol. XIII. 1909. See index for references.) XII

New York (State). Memorial of the citizens of New York in favor of a canal navigation between the great western lakes and the tide-waters of the Hudson. N. Y.: Samuel Wood and Sons. 1816.....XII

—— Report of the committee on commerce and navigation on the bill for the incorporation of the Niagara ship canal company, transmitted to the legislature January 22, 1864. Albany: Comstock and Cassidy. 1864. (Sen. doc. 21. January 22, 1864.).....XII

New York state reservation at Niagara. By-laws of the commissioners, together with the ordinances, rules and regulations for the government of the reservation. 2d ann. rep't of the com'rs of the state reserv. at Niagara. Albany: 1887. Pp. 25–28.).....XI

—— Extracts from annual reports. (Ann. rep'ts of the com'rs of the state reserv. at Niagara. 21:81–116.).....XI

—— Official correspondence and opinions. (Ann. rep'ts of the com'rs of the state reserv. at Niagara. 21:117–148.).....XI

—— Resolutions and correspondence relating to a roadway from the state reservation at Niagara to Lake Ontario. (5th ann. rep't of the com'rs. Albany: 1889. Pp. 51–55.).....XI

New York State. Reservation Commission at Niagara. Map and guide of the New York State Reservation at Niagara. Buffalo: (188—?) IX

New York (State). Surveys of the crest of Niagara Falls. (Ann. rep'ts of the state engineer and surveyor (1890). Albany: J. B. Lyon. 1891. Pp. 29–31.).....VII

New York state survey. Special report on the preservation of the scenery of Niagara Falls, and fourth annual report on the triangulation of the state for the year 1879. James T. Gardner, Director. Albany: Charles Van Benthuysen and Sons. 1880. Pp. 1–42.....XI

—— Special report on the preservation of the scenery of Niagara Falls, and fourth annual report on the triangulation of the state for the year 1879. James T. Gardner, Director. Albany: Charles Van Benthuysen and Sons. 1880. Pp. 27–31.....VI

New York state tourist (The). Descriptive of the Mohawk and Hudson rivers. N. Y.: Goodrich. 1840. Pp. 75–82.....XII

New world in 1859 (The), being the United States and Canada, illustrated and described. . . . Lond.: n.d. (1859) Pp. 72–76 XII

News for bibliophiles. (Nation, Oct. 20, 1910. 91:360–361.)

[Newton, Samuel B.] Niagara and Chautauqua. Compliments of Western New York and Pennsylvania Railroad. Buffalo: Wenborne-Sumner. [1891] XII

Niagara. (Harp., Aug., 1853. 7: 289–305.)

—— (Hist. mag., Jan., 1871. 2d sec. 9: 79.) V

—— (Mag. Am. hist. April, 1887. 17: 349–350.) V

Niagara I. (Nation, Oct. 12, 1871. 13: 238–239.) XI

Niagara II. (Nation, Oct. 19, 1871. 13: 254–255.) XI

Niagara. (*In* Billardon de Sauvigny, Edme Louis. Hirza, on Les Illinois, tragedie. Paris: Le veuve Duchesne. 1780. Frontispiece.) IX

Niagara. (*In* Longfellow, H. W., Poems of places. Boston: James R. Osgood and Co. 27:158–159.) VIII

Niagara. (*In* Porter, P. A., Goat Island. (Niagara Falls, N. Y.:) 1900 VIII

Niagara a great workshop. (Can. eng. Oct., 1906. 13: 360.)

Niagara: a mischievous bill. (Outl., Feb. 23, 1907. 85: 388.) XI

Niagara. [A poem.] N.p. N.d.

Niagara. A poem, by a member of the Ohio bar. N. Y.: Edward O. Jenkins. 1848 VIII

Niagara again. (Outl. May 19, 1906. 83:106–107.) XI

Niagara again in danger. (Cent., May, 1913. 86:150–151.) .XI

Niagara and beyond. . . . Chicago: Rand, McNally & Co. 1887.

Niagara, and how to see it. Meetings of the S. A. F. and O. H. 1907. Pp. 33–34 XII

Niagara and Shawenegan. (Sat. rev., Dec. 6, 1884. 58: 719–720.)

Niagara and the nation. (Outl., Apr. 14, 1906. 2: 828–830.) .XI

Niagara and Victoria. (Sci. Am., Sept. 2, 1911. 105: 203.) . .V

Niagara as an industrial center. (Sci. Am. May 27, 1899. 80: 343–344.)

Niagara book (The), a complete souvenir of Niagara Falls; containing sketches, stories and essays . . . by W. D. Howells, Mark Twain, Prof. Nathaniel S. Shaler, and others. Buffalo: Underhill and Nichols. 1893 XII

Niagara break-down (The). (Elec. wld. & eng. Feb. 7, 1903. 41: 224.)

Niagara-Buffalo transmission (The). (Elec. rev., Jan. 1, 1897. 40: 6–7.)

Niagara-Buffalo transmission line (The). (Elec. rev. June 23, 30, 1897. 30: 298, 310.) X

———. (Elec. rev. July 7, 14, 1897. 31: 4, 16–17.) X

Niagara by moonlight. (*In* Rhine, Alice Hyneman ed., Niagara park illustrated. . . . N. Y. Niagara Pub. Co. 1885c. P. 60.) VIII

Niagara by night. (Leisure hr., May 12, 1866. 15: 301.) V

Niagara campaign (The). (Outl., Jan. 27, 1906. 82: 150.) .. XI

Niagara dispute (The). (Elec. wld. & eng. Jan. 5, 1907. 49: 13.) X

Niagara Falls. [Buffalo: Mathews, Northrup. 1890] V

—— [Buffalo and N. Y.: Mathews, Northrup. 1890.] XII

—— (Elec. (Lond.:) Sept. 13, 1907. 59: 865.)

—— A guide and souvenir with a new series of views from photographs taken on the spot. Buffalo: Sage Sons and Co. 1864 XII

Niagara Falls companion, and fashionable miscellany (The) . . . Opinions and remarks of Capt. Basil Hall, Don Jose Maria Heredia, and . . . other person. . . . N.p. 1834.

Niagara Falls convention; the cataract and city of its name,— Their early history and world-wide fame — Romantic legend, etc. . . . (St. ry. rev. Sept. 1897. 7: 633–669.)

Niagara Falls accident (The). (Elec. rev. Feb. 7, 1903. 42: 185.)

Niagara Falls again. (Outl., Feb. 25, 1911. 97: 381.) XI

Niagara Falls again threatened. (Sci. Am., May 27, 1911. 104: 518.) XI

Niagara Falls and Buffalo electric power transmission (The). (Eng. news, Dec. 10, 1896. 36: 389–390.)

Niagara Falls as a source of energy. (Am. jour. sci., Nov., 1881. 122: 397.) X

Niagara Falls as an electro-chemical center. (Cur. lit., June, 1902. 32: 728–729.) X

Niagara Falls association. Report of the executive committee. Jan., 1885. Privately printed. 1885 XI

Niagara Falls — Buffalo transmission (The). (Elec. rev. Dec. 1, 1897. 31: 260.)

Niagara Falls — Buffalo power transmission line (The). (Elec. wld. June 5, 1897. 29: 724.) X

Niagara Falls. (Chutes du Niagara) Paris: 1837 IX

Niagara Falls dry for a day. (Canadian naturalist. Montreal. 1883. 2d ser., 10: 63.).....V

Niagara Falls electric power plant (The). (Sci. Am. Jan. 25, 1896. 74: 55.).....X

Niagara Falls electrical handbook (The). Being a guide for visitors from abroad attending the international electrical congress, St. Louis, Mo., September, 1904. Published under the auspices of the American institute of electrical engineers, Niagara Falls. 1904....X

Niagara Falls from a new point of view. (Sci. Am., Sept. 9, 1911. 105: 227.).....XI

I. Niagara Falls from the Ferry. II. Aus fluss des Niagara. III. Outlet of the Niagara. IV. Below Table Rock (Niagara). V. Niagara Falls (central view from Clifton House). (Grosvenor library, Buffalo, N. Y. Views of Niagara Falls. 1697–187—. Mat 14.).....IX

Niagara Falls. (General view from Clifton House). Pub. for Hermann J. Meyer. N. Y. [1854].....IX

Niagara Falls guide (The). With full instructions to direct the traveler to all the points of interest at the Falls and vicinity . . . Buffalo: Burke. 1848.....XII

Niagara guide book (The), being a synopsis of Steele's Book of Niagara Falls. 2d ed. Buffalo, N. Y.: Steele's press. 1846.

Niagara Falls guide with full instructions to direct the traveller to all points of interest at the Falls and vicinity (The); . . . 5th ed. rev. Buffalo: James Faxon. 1851.....XII

Niagara Falls hydraulic power and manufacturing company's plant. (Eng. rec. January 20, 1900. 41: 53–56.)

Niagara Falls hydraulic power and manufacturing company. (Elec. wld. June 5, 1897. 29: 730–731.).....X

Niagara Falls hydraulic power plant. (Sci. Am. April 4, 1896. 74: 215.).....X

Niagara Falls hydraulic tunnel (The). (Am. architect. April 16, 1887. 21: 189–190.)

Niagara Falls illustrated. N. Y.: Albertype Co. [1888]....XII

Niagara Falls in winter: its scenery and ice bridge. [Buffalo. n.d.].....V

Niagara Falls industrial number. (Sci. Am. sup., Mar. 3, 1900. 49: 20207–20220.).....X

Niagara Falls marine railway. Report [of the chief engineer] on a marine railway around the Falls of Niagara. 1864. N. Y.: 1864

Niagara Falls paper company's power plant (The). (Eng. news, Apr. 26, 1894. 31: 350–351.)

Niagara Falls park and river railway. Niagara river from the rapids above the falls to Lake Ontario. [Buffalo: Matthews, Northrup. 1895.] XII

Niagara Falls power. Its application and use on the Niagara frontier. Buffalo: Courier Co. 1901.

Niagara Falls power company. (Annual reports. N. Y.?: 1906–19—.)

—— (Elec. wld. June 5, 1897. 29: 721–723.) X

—— (Eng. news. Nov. 8, 1890. 24: 418.) X

—— Information for visitors. Sept. 1, 1906. no. imp.

Niagara Falls power company and Canadian-Niagara power company. Information for visitors. April 1, 1910. . . . X

Niagara Falls power company's new turbines. (Eng. rec., Oct. 18, 1903. 68: 443–444.) X

Niagara Falls power developments. (Elec. rev., Aug. 17, 1906. 59: 265.) X

Niagara Falls power plant. (Elec. wl'd. February 6, 1892. 19: 85–86.)

—— (Eng. news, May 24, 1894. 31: 426–428.)

—— (Eng. news, May 31, 1894. 31: 447.)

Niagara Falls power question (The). (W. elec. Jan. 26, 1907. 40: 93.) X

Niagara Falls power tunnel (The). (Eng. news, Dec. 29, 1892. 28: 614.)

Niagara Falls; quotation from the Report of Luther R. Marsh on the Reservation of Niagara Falls. (Mag. Am. hist. Dec., 1885. 14: 610–611.) XI

Niagara Falls runs dry. (Harp. w., Apr. 4, 1903. 47: Pt. 1, 543.) V

Niagara Falls sketch book. Buffalo: Sumner. 1888c. IV and XII

Niagara Falls the great manufacturing village of the West; being a statement of the operations of the Niagara Falls hydraulic company, with an appendix containing the charter and by-laws of the company, letters from distinguished engineers. . . . Boston: 1853.

Niagara Falls tunnel (The). (Elec. rev., Feb. 20, 1892. 19: 352.) X

Niagara Falls turbines (The). (Eng. news, Apr. 6, 1893. 29: 331.)

Niagara Falls water volume. (Eng. rec., Mar. 21, 1891. 23: 256.)

[Niagara frontispiece] *and* Niagara Falls from the American shore. (Grosvenor library, Buffalo, N. Y. Views of Niagara Falls. 1697–187—. Mat 15.).....IX

Niagara gorge (The). [A review of Taylor on "Origin of the gorge of the whirlpool rapids at Niagara."] (Science. May 6, 1898. New ser. 7: 627.).....VII

Niagara gorge railway. (Eng. mag. Nov. 1900. 20: 284–286.)

Niagara in danger again. (Outl., May 20, 1911. 98: 88.)..XI

Niagara in summer and winter. no imp.....XII

[Niagara in winter] (Harp. June, 1852. 5:127.).....V

—— (Harp. mo., Feb., 1855. 10: 410–411.).....V

Niagara in winter. (Lit. liv. age, Mar. 17, 1866. 88: 799.)....V

Niagara in winter dress. (Harp. w., Mar. 5, 1881. 25:158.)..V

Niagara, its falls and scenery, etc. N. Y.: Alexander Hubbell & Co. 1848.

Niagara; its falls and scenery . . . . N. Y.: Harthill [1859 c] Pp. 1–17 XII

Niagara mastered. (Eng. (Lond.:) Oct. 14, 1892. 74: 319.)..X

Niagara on tap. (Lit. digest. April, 1916. 52:963–964.)....X

Niagara: [photographic views] no imp.....XII

Niagara plant of the Ontario power company. (Elec. wld. & eng. Mar. 4, 1905. 45: 423.)

Niagara power. (Cur. lit., Aug., 1900. 29:127–128.).....X

—— (Elec. rev. July 7, 1897. 31:10.).....X

—— (Elec. rev., July 13, 1906. 59: 80.).....XI

—— (Elec. wld. & eng. Mar. 23, 1907. 49: 586.)

—— (Elec. wld., June 13, 1908. 51:1721.).....X

Niagara power at Syracuse. (Ry. & eng. rev. June 1, 1907. 47: 458–459.) X

Niagara power banquet. (Elec. wld. Jan. 16, 1897. 29: 83, 85–86.)

Niagara power for Canada. (Elec. wld. & eng. Feb. 2, 1907. 49: 223.)

Niagara power for Canadian cities. (W. elec. Dec. 26, 1903. 33: 483.)

Niagara power for the Buffalo railway. (St. ry. rev. Aug. 15, 1896. 6: 506–507.)

—— (St. ry. rev. Dec. 15, 1896. 6: 757–758.)

Niagara power for the Buffalo railway system. (St. ry. jour., Dec. 1896. 12: 772–775.) X

Niagara power in Buffalo. (Elec. rev. Dec. 29, 1897. 31: 309.) X

—— (Elec. rev. Jan. 20, 1897. 30: 26.)

—— (Elec. wld. & eng. Nov. 4, 1905. 46: 771–773.)

Niagara power in the gorge. I. (Elec. wld. & eng. Nov. 18, 1905. 46: 837–839.) X

—— II. (Elec. wld. & eng. Nov. 25, 1905. 46: 899–900.) X

Niagara power in Toronto. (Elec. wld. & eng. June 24, 1905. 46: 1167–1170.) X

Niagara power plant. I. (Eng. rec., Sept. 24, 1892. 26: 266–268.) X

Niagara power plant of the electrical development company of Ontario (The). I. Description of design and structures. (Eng. news, Nov. 9, 1905. 54: 475–478.)

—— II. Methods of construction. (Eng. news, Nov. 30, 1905. 54: 561–564.)

Niagara power privileges. (W. elec. April 18, 1896. 18: 187.)

Niagara power schemes. (Eng. Feb. 16, 1906. 81: 218–220.) X

Niagara power transmission, the electrical exposition, and Mr. Johnson's libel suit. (W. elec. May 30, 1896. 18: 271.)

Niagara preservation number. (Chaut., Aug., 1907. 47: 260, 277–379.) XI

Niagara problem under legislation. (Pop. sci. mo., May, 1906. 68: 473–475.) XI

Niagara railway arch (The). (Eng. mag. June, 1898. 15: 475–476.)

Niagara railway suspension bridge (The). (Engineering. Dec. 9, 1887. 44: 595–598.)

Niagara reservation (The). (Critic, Mar. 21, 1896. 28: 203.) XI

Niagara river. (Sci. Am. sup. Jan. 31, 1882. 13: 5045.)

Niagara river development. (Sci. Am., Oct. 12, 1901. 85: 230.) X

Niagara river from the rapids above the Falls to Lake Ontario (The). Buffalo and N. Y.: Matthews, Northrup and Co. N.d. XII

Niagara ship canal, its military and commercial necessity. N. Y.: 1863.

Niagara the majestic . . . Buffalo, N. Y.: C. D. Arnold. 1901.

Niagara. The Niagara Falls power company, Niagara Falls, N. Y., and the Canadian Niagara power company, Ontario, April 1, 1907. Bensler Press Co. Buffalo: n.d. X

Niagara's industrial beauty. (Lit. dig., Dec. 7, 1912. 45: 1060–1061.)

Niagara's oldest power plant. (Harp. w., June 14, 1913. 57, pt. 1:16.) X

Nichols, T. L. Forty years of American life. 2d ed. Lond.: Longmans, Green. 1874. Pp. 204–205 IV

Nikola Tesla and the electrical outlook — the new development in power transmission. (R. of R. Sept., 1895. 12: 293–294.) X

Noble, Louis L. The course of empire, Voyage of life, and other pictures of Thomas Cole, N.A.; with selections from his letters and miscellaneous writings; illustrative of his life, character and genius. N. Y.: Cornish, Lamport, and Co. 1853. Pp. 104–106; 375–377 IX

Noel, J. (del.) Outhwaite (sc.) Les cataracts du Niagara. [1860?] (Grosvenor library, Buffalo, N. Y. Views of Niagara Falls. 1697–187–. Mat 16.) IX

—— (del.) Outhwaite (sc.) Pont suspender sur le Niagara [1860?] (Grosvenor library, Buffalo, N. Y. Views of Niagara Falls. 1697–187–. Mat 22.) IX

[Norman, Henry.] The preservation of Niagara. (Nation, Sept. 1, 1881. 33:170–171.) XI

Norris, Henry H. Electric progress in United States in 1906. (W. elec. Jan. 5, 1907. 40:7.)

North America according to the latest observations. (*In* Gordon, Patrick, Geography anatomiz'd: or the geographical grammar. Lond.: Knapton, Knaplocke and Co. 1733. Opp. p. 343.) IX

North American tourist (The). N. Y.: Goodrich. N.d. Pp. 85–82 XII

Northern tour (A); being a guide to Saratoga, Lake George, Niagara, Canada, Boston, etc. . . . Phila.: Carey and Lea. 1825. Pp. 147–150 XII

Northern traveler (The); containing the routes to Niagara, Quebec, and the Springs, with the tour of New England, and the route to the coal mines of Pennsylvania. 2d ed. imp. & ext. N. Y.: A. T. Goodrich. 1826. Pp. 80–95 XII

Northern traveller and northern tour (The); with the routes to the Springs, Niagara, and Quebec. N. Y.: J. and J. Harper. 1830.

Norton, Thomas H. Niagara on tap. (Pop. sci. mo. February, 1916. 88:180–184.) X

Notes on electric transmission of power from Niagara Falls. (Eng. rec., Sept. 14, 1901. 44:247.)

Notice of map of Niagara gorge. (Am. Geog. Soc. N. Y.: Nov., 1913. Bull. 45:849.) VII

Notice of new calcium carbide works at Niagara Falls. (Eng. news, Apr. 30, 1896. 35:280.)

Nunn, Paul N. The development of the Ontario power company. (Presented at 22d ann. conv. of the Am. inst. elec. engrs. Asheville, N. C., June 19–23, 1905.) X

—— The development of the Ontario power company. Niagara Falls: The Ontario power company. n.d.

—— Hydro-electric enterprise in Canada. (Can. eng., Mar., 1905. 13:72–88.) X

Oakley, G——. Rapids and bridge above the Falls of Niagara. (Grosvenor library, Buffalo, N. Y. Views of Niagara Falls. 1697–187–. Mat 23.) IX

O'Bryan, William. A narrative of travels in the United States . . . Lond.: Printed for the author. 1836. Pp. 192–196 III

Observation tower, Niagara Falls. (Eng. (Lond.:) May 8, 1903. 95:470.) V

O'Callaghan, E. B. The documentary history of the state of New York. Albany. 1849. 1:155, 157 V

—— The documentary history of the state of New York. Albany. 1849. 1:201, 203, 232 V

—— The documentary history of the state of New York. Albany. 1849. 2:792 V

—— The documentary history of the state of New York. Albany. 1849. 2:868 V

—— The documentary history of the state of New York. Albany. 1849. 2:871 V

—— The documentary history of the state of New York. Albany. 1849. 2:1165–1168 V

O'Ferrall, Simon Ansley. A ramble of six thousand miles through the United States of America. Lond.: Effingham Wilson. 1832. Pp. 27–33.

Offenbach, Jacques. America and the Americans. Lond.: William Reeves. (1877). Pp. 74–75.....IV and XI

Ogden, John Cosens. A tour, through Upper and Lower Canada. By a citizen of the United States . . . Litchfield. 1799. Pp. 110–112 XII

Olmstead, Frederick Law, *and* Vaux, Calvert. General plan for the improvement of the Niagara reservation. Niagara Falls, N. Y.: 1887 XI

One hundred tons of calcium carbide. (Eng. news, May 4, 1899. 41:291.)

Ontario and St. Lawrence steamboat company (The). Handbook for travellers to Niagara Falls, Montreal and Quebec, and through Lake Champlain to Saratoga Springs. Buffalo: Jewett, Thomas and Co. Pp. 36–49.....XII

—— Inset of Horseshoe Fall. (Grosvenor library, Buffalo, N. Y. Views of Niagara Falls. 1697–187–. Mat 22.).....IX

Ontario — Hydro-electric power commission. Annual reports 1–5.

Ontario-New York. Topographic map of the Niagara gorge. (U. S. geol. surv., G. O. Smith, Dir. *and* Geol. surv. of Can., R. W. Brock, Dir. 1913. 1:12,000.).....VII

Ontario 110,000-volt power transmission system (The). (Eng. news, Mar. 18, 1909. 61:301.)

[Ontario power company.] (Elec. rev., May 12, 1905. 56: 778.)

Ontario power company begins operations (The). (Elec. wld. & eng. July 15, 1905. 46:91.)

Ontario power company's development at Niagara Falls. (W. elec. Dec. 26, 1903. 33:481.)

Ontario power company's plant at Niagara Falls. (Sci. Am., Feb. 11, 1905. 92:126.).....X

Ontario power plant at Niagara. (Elec. wld. & eng. Mar. 18, 1905. 45:508.) X

Opening of the Niagara Canadian power company's plant. (Sci. Am., Feb. 4, 1905. 92:104–105.).....X

Orbigny, Alcide Dessalines D.' Voyage pittoresque dams les deux Ameriques . . . Paris: chez L. Tenre. 1836. Pp. 477–479.

[Original resolution describing the proposed limits of the Niagara reservation.] (1st Ann. rep't of the com'rs of the state reserv. at Niagara. Albany: 1886. Pp. 11–15.).....XI

Ossoli, Sarah Margaret Fuller. At home and abroad; or, Things and thoughts in America and Europe. (Arthur B. Fuller, *editor.*) 3d ed. Bost., and Lond.: 1856. Pp. 3–10.....IV

—— ***Marchesa d'.*** Summer on the lakes, in 1843 . . . Bost.: Little and Brown; N. Y.: Francis. 1844. Pp. 1–13.....IV

Other uses of Niagara power. (Elec. wld. June 5, 1897. 29: 734.)

Ottens, R. *and* J. Carte des possessions Angloises et Françoises du continent de l'Amérique Septentrionale. Kartt van de Englesche en Fransche bezittingen in hets vaste land van Noord America, 1755. À Amsterdam: Chez R. et J. Ottens.....IX

Over Niagara Falls. (Harp. w., Sept. 29, 1866. 10: 612.)..VIII

Overbury, Frederick. Electro-chemistry at Niagara Falls. (Cass. July, 1897. 12: 227–230.).....X

Overton, Henry. A map of the British plantations on the continent of North America, according to the notes and improvements of mr. Bolton, made in the original of mr. Danville with the history of each colony in the margin . . . [1755–1760.].....IX

Owahyah. Birch bark legends of Niagara, founded on traditions among the Iroquois, or Six nations; a story of the lunar-bow, which brilliantly adorns Niagara Falls by moonlight; or Origin of the totem of the wolf. St. Cath., Ont.; Jour. Printing Co., 1884.....VIII

Oxley, J. Macdonald. Niagara under yoke. (Wld. today. Sept., 1907. 8: 298–306.).....X

Paasche, Hermann. Kulture-und Reiseskizzen aus Nord — und Mittel-Amerika. Magdeburg: Albert Rathke. 1894. Pp. 24–31.

Palacio, Don Vicente Riva *and* Mateos, Don Juan A. La cataracta del Niagara. (*In their* Dramatic works. Mexico City. 1871.).....VIII

Palairet, I——. Carte des possessions Angloises et Françoises du continent de l'Amérique Septentrionale. Londres: 1759. (Am. maps. 2: No. 23.).....IX

Palmer, B. Frank. Apostrophe to Niagara. (*In* Porter, Peter A., Official guide. Niagara Falls, river, frontier . . . Buffalo: The Matthews Northrup Works. 1901. Pp. 289–290.).....VIII

Panoramic view of Niagara. c. 1852.....IX

Panton, J. Hoyes. Flora of Queen Victoria Niagara Falls park. (Ann. rep'ts of the com'rs for Queen Victoria Niagara Falls park. 1889. 4:17–31.) VI

Park, *Rev.* Roswell. Niagara Falls. (*In his* Jerusalem; and other poems, juvenile and miscellaneous . . . N. Y.: Stanford. 1857. Pp. 172–175.) VIII

—— Niagara Falls. (*In his* Selections of juvenile and miscellaneous poems. Phila.: Desilver, Thomas. 1836. Pp. 70–73.) VIII

Parker, John C. Niagara power at the Lackawanna steel plant. (Elec. jour. Jan., 1907. 4: 32–42.)

Parkman, Francis. Historic handbook of the northern tour. Lakes George and Champlain. Niagara, Montreal, Quebec. Bost.: Little, Brown. 1885. Pp. 93–101 V

[Parrott, Caryl S.] A descriptive reading on Niagara Falls . . . Phila.: W. H. Rau. 1890 IV

Parsons, Horatio A. The book of Niagara Falls. 3d ed. Carefully rev. and enl., and accompanied by maps. Buffalo: Oliver G. Steele. 1836 XII

—— A guide to travelers visiting the Falls of Niagara, containing much interesting and important information respecting the Falls and vicinity, accompanied by maps. 2d ed. greatly enl. Buffalo: Oliver G. Steele. 1835 XII

Part of the fall of Niagara, on the side of Canada. (Grosvenor library, Buffalo, N. Y. Views of Niagara Falls. 1697–187–. Mat 8.) IX

Passenger department of the Richelieu and Ontario Navigation Company. Official guide, 1900. From Niagara to the sea . . . n.p. Pp. 5–9 XII

Passing of the Niagara observation tower. (W. elec. Dec. 5, 1903. 33: 430.) V

Patton, Edmund. A glimpse at the United States and the northern states of America, with the Canadas, comprising their rivers, lakes and falls during the autumn of 1852 . . .Lond.: Effingham Wilson. 1853. Pp. 91–96 .....IV and VI

Paul's dictionary of Buffalo, Niagara Falls, Tonawanda, and vicinity. Buffalo: Peter Paul Book Co. (1896). Pp. 170–256 XII

Payne, J. Universal geography . . . Lond.: 1792. 2: 657 V

Peck's tourist's companion to Niagara Falls, Saratoga Springs, the Lakes, Canada, etc. . . . Buffalo: William B. *and* Charles E. Peck. 1845 XII

Pen and sunlight sketches of scenery reached by the Grand trunk railway system and connections, with routes and rates for summer tours. 1896. Pp. 18–25 XII

Pendelton ——. Niagara; Niagara Falls. (Grosvenor library, Buffalo, N. Y. Views of Niagara Falls. 1697–187—. Mat 12.) IX

Pennell, Joseph. Niagara Falls. (Cent., May, 1911. 82: 77–82.) IX

People's guide to Buffalo, Niagara Falls and Chautauqua lake. Buffalo. 1880. Pp. 71–82 XII

Perkins, Frank C. Canadian Niagara power for Buffalo. (W. Elec. June 19, 1907. 40: 57.)

—— The great ice jam at Niagara. (Sci. Am., May 1, 1909. 100: 339.) V

—— The Niagara power transmission plant. (Elec. wld. Feb. 9, 1895. 25: 165–167.) X

—— Niagara power transmission up to date. (Elec. wld., Nov. 21, 1896. 28: 621–622.)

—— Six Niagara power installations under way — a million horse-power to be developed at Niagara Falls. (Elec. wld. & eng. April 11, 1903. 41: 601–604.) X

—— Two proposed methods of transmitting power from Niagara Falls to Chicago. (Elec. wld. & eng., Feb. 20, 1892. 29: 121–122.)

Person, C. W. Air route over the whirlpool. (Illus. wld. June 16, 1916. 25: 479–480.)

—— Nerviest man; untangling cables over the Niagara whirlpool. (St. Nicholas. March, 1917. 44: 459–460.)

—— Over the whirlpool by aerial cable. (Sci. Am. March 25, 1916. 114: 330.) XII

Petite chute du Niagara (162 P. de Haut.) (Grosvenor library, Buffalo, N. Y. Views of Niagara Falls. 1697–187—. Mat 5.) . IX

Pfeiffer, Ida Reyer. A lady's second journey round the world. Lond.: Longman, Brown, Green, and Longmans. 1855. 2: 337–344 IV

Philoppoteaux, Paul. Cyclorama of Niagara. 400 x 50. (1888.) IX

Pictorial guide to the Falls of Niagara: a manual for visitors . . . Buffalo: Salisbury and Clapp. 1842 XII

Pidgeon, Daniel. An engineer's holiday; or, Notes of a round trip from longitude o° to o°. Lond.: Keegan Paul, Trench & Co. 2v. 1882. I:93–106 IV

Pierie, William. View of the cataract of Niagara, from a drawing taken on the spot by Lt. Pierie of the Royal Artillery. Richard Wilson Pinx. William Byrne (sc.) 1768 IX

Pinkerton, John. A general collection of the best and most interesting voyages and travels in all parts of the world. . . . Lond.: Longman. 1812. 13:296.

Pioneer work at Niagara. (Am. elec. Jan., 1900. 12:38.) X

Plea for the conservation of Niagara Falls (A). (Eng. news, Dec. 21, 1905. 54:668.)

Pocket guide to Niagara Falls. The complete illustrated guide to Niagara Falls and vicinity. no imp XII

Pohlman, Julius. The life history of Niagara. (Trans. Am. inst. mining engrs. Buffalo meeting. 1888. 17:322–338.) VII

—— Life history of the Niagara river. (Proc. A. A. A. S. Aug., 1883. 32:202.) [Abstract] VII

—— Niagara Falls. (*In* Encyclopedia Americana. ed. by F. C. Beach & others. Americana Co. N. Y.: 1904. Vol. II.) VII

—— The Niagara gorge. (Pre-glacial erosion along the course of the Niagara.) (Proc. A. A. A. S. Aug., 1886. 35:221–222.) [Abstract] VII

Pond, Chester E. The Falls of Niagara. Our school of sublimity . . .. Topeka, Kan.: 1888 IV

Poole, Stanley Lane. The life of the Right Hon. Stratford Canning, Viscount Stratford de Redcliffe. . . . Lond.: Longmans, Green. 1888. 1:331–334 XII

Pope, Franklin Leonard *and* Pope, Ralph R. The distribution of electric power at Niagara. (Eng. mag., Dec., 1895. 10:407–417.) X

Popham, William Lee. Niagara Falls romance. Louisville, Ky.: The World Supply Co. (c 1911.) VIII

Popple, Henry. America Septentrionalis. A map of the British empire in America with the French and Spanish settlements adjacent thereto. By Henry Popple. (Am. maps. II, No. 8.) IX

—— Map of America; Mariland, Pensilvania, New Jersey, New York, and the western part of Connecticut. N.d IX

Popple, Henry. A map of the British empire in America. fol. Lond.: W. H. Toms & R. W. Seale. 1733.....IX

—— A map of the British empire in America with the French and Spanish settlements adjacent thereto. (Maps of America I, No. 17.) IX

—— A map of the British empire in America with the French, Spanish and Dutch settlements adjacent thereto. Certified by Edmund Halley. Amsterdam: Covens and Mortier. N.d.....IX

Porter, Albert H. Reminiscences of Niagara from 1806 to 1872, with a list of the early settlers. By an old resident. Printed for private circulation. Niagara Falls: Pool. 1872.....V

—— Some details of the Niagara tunnel. (Cass. July, 1895. 8: 203–210.) X

Porter, Peter Augustus. A catalogue of books, pamphlets, engravings, etc., relating largely to Niagara Falls. N.p. N.d.

—— Champlain not Cartier made the first reference to Niagara Falls in literature. Niagara Falls. 1899.....V

—— The complete illustrated guide to Niagara Falls and vicinity. (Niagara Falls: Gazette Printing Office. 1883.).....XII

—— The first buildings ever erected by white men at Niagara Falls, in 1745. (Niagara Front. Hist. Soc. leaf.) n.d.....V

—— The first reference to Niagara Falls in literature. [Niagara Falls, N. Y.: Gazette Pub. Co. 1899.]

—— Goat Island. (Ann. rep'ts of the com'rs of the state reserv. at Niagara. 16:75–128.).....V

—— Goat Island. [Niagara Falls, N. Y.:] 1900.

—— Historic Niagara. (Ann. rep'ts of the com'rs of the state reserv. at Niagara. Albany. 1894. 10:57–71.).....V

—— How lake commerce began; La Salle's visits to the Niagara. Niagara Falls, N. Y.: n.d. P. 11.....V and IX

—— A legend of Goat Island ascribed to Father Louis Hennepin, who visited Niagara in 1678. . . . Niagara Falls: (1900)..VIII

—— [Lines in a young lady's album.] (*In* Johnson, R. L., Niagara, its history, incidents and poetry . . . Wash.: W. Neale. 1898. Pp. 49–50.) VIII

—— Niagara an aboriginal center of trade. Niagara Falls. 1906..V

—— Niagara county in that souvenir history. 1902. P. 1 ff.

Porter, Peter A. The Niagara region in history. (Cass. July, 1895. 8: 365–384.) V

Porter, Peter A. Official guide. Niagara Falls, river, frontier: scenic, electric, historic, geologic, hydraulic. With illustrations by Charles D. Arnold. [Buffalo: The Matthews Northrup Works. 1901.] . .XII

Porter's Niagara Falls collection. (Nation. Oct. 20, 1910. 91: 360–361.)

Potter, Alvah K. Address to the international commissioners appointed to investigate concerning the conditions and uses of the waters adjacent to the boundary lines between Canada and the United States, at Niagara Falls, New York, September 14, 1905. (Ann. rep'ts of the com'rs of the state reserv. at Niagara. 22: 77–81.) XI

Pouchot, M. ——. Memoir upon the late war in North America, between the French and English, 1755–60; followed by observations upon the theatre of actual war, and by new details concerning the manners and customs of the Indians; with topographical maps. Translated and edited by Franklin R. Hough. Roxbury, Mass.: W. Elliott Woodward. 1866. 2:153–156.....I and XII

Powell, Ann. Journal of a tour from Montreal to Detroit, 1789, with notes by Eliza Susan Quincy. (Mag. Am. hist., July, 1880. 5: 37–46.) II

Power development of the Toronto and Niagara power company. (Eng. rec., Feb. 13, 1904. 49:180–183.).....X

Power developments at Niagara. (Eng. mag., Feb., 1900. 18: 776–777.)

Power from Niagara. (Can. eng. April, 1902. 9: 91.)

—— (Current lit. August, 1900. 29:127.)

Power houses at Niagara. (Sci. Am. sup. Dec. 19, 1903. 56: 23386.)

Power interests at Niagara Falls. (W. elec. Mar. 14, 1896. 18:127.) X

Power of Niagara (The). Niagara Falls power co. Niagara Falls, N. Y.: 1906.....X

—— (Pub. opin., Sept. 7, 1899. 27:303.).....X

—— Taking stock of the energy utilized. (Sci. Am. sup. Sept 23, 1911. 72: 208.).....X

Power of the flood. (Cur. lit., Aug., 1900. 29:127–128.) X

Power plant of the Niagara Falls hydraulic power and manufacturing company (The). (Elec. wld. Jan. 14, 1899. 33:43–46.)

Power plant of the Niagara Falls hydraulic power and manufacturing company. (Power. Dec. 17, 1895. 15: 17.) X
Power stations at Niagara (The). (Sci. Am. sup., Feb. 3, 1894.X
Power, Tyrone. Impressions of America, during the years 1834 and 1835. Lond.: Richard Bentley. 1836. 1: 391–411.....XI
Prentice, Archibald. A tour in the United States. Lond.: 1848. Pp. 73–74 IV
Prescott, William H. Letter to the Earl of Carlisle regarding a Niagara picture by Lebron, under date of January 27, 1851. (Pub. Buf. Hist. Soc. 15:141–143.).....IX
Present condition of the Niagara Falls power plant (The). (Jour. Frank. inst., Mar., 1895. 139: 228.)
Preservation of Niagara Falls. (Ann. rep'ts of the com'rs of the state reserv. at Niagara. 28:10–15.).....XI
[Preservation of Niagara Falls.] (Critic, Feb. 17, 1883. 3: 71–72.) XI
—— (Eng. news, Apr. 16, 1903. 49: 347.).....XI
Preservation of Niagara Falls (The). (Harp. w. May 15, 1880. 24: 315.).....XI
[Preservation of Niagara Falls.] (Harp. Dec., 1882. 66:151–152.) XI
Preservation of Niagara (The). (Nature, June 11, 1885. 32: 131–132.) XI
Preservation of Niagara Falls. (Outl., Apr. 7, 1906. 82: 772.) XI
—— (Outl., July 21, 1906. 83: 632–633.).....XI
Preservation of Niagara Falls (The). (Outl., Feb. 3, 1912. 100: 257–258.) XI
Preservation of Niagara (The). (Sci., May 15, 1885. 5: 398–399.) XI
Preserve Niagara. (Outl., Oct. 14, 1905. 81: 348.).....XI
Preston, T. R. Three years' residence in Canada, from 1837 to 1839, with notes of a winter voyage to New York, and journey thence to the British possessions. Lond.: Richard Bentley. 1840. 2:11–20..III
Priest, William. Travels in the United States of North America, commencing in the year 1793, and ending in 1797. . . . Lond.: J. Johnson. 1802. P. 200.....VII
Prieto, Guillermo. Viaje a los Estados-Unidos. Por Fidel. 3 vols. Mexico: Dublan y Chavez. 1878. 2: 285–312.....VIII

Princess Louise at Niagara (The). (Harp. w. Mar. 22, 1879. 23:237.)

Pringle, J. F. Lunenburgh or the old eastern district, its settlement and early progress: with personal recollections of the town of Cornwall, from 1824 . . . Cornwall. 1890. Pp. 112, 165.....XII

Prior, Samuel. Niagara Falls woodcut. (*In his* The universal traveller . . . Lond.: 1823. Pp. 579–582.).....IX

—— The universal traveller, containing the popular features and contents of the best standard modern travels in the four quarters of the world. London. 1823. Pp. 579–582.....V

Pritchard, F. E. Power transmission at Niagara. (Elec. wld., Apr. 16, 1892. 19:258.).....X

Pritchard, Myron T., *comp.* Poetry of Niagara . . . compiled by M. T. Pritchard. Bost.: Lothrop Pub. Co. (1901).....VIII

Proctor, Richard A. Niagara. (Knowl. Aug. 3, 1883. 4:72–74.).....V

Production of chlorate of potash at Niagara Falls. (Jour. soc. chem. ind., Oct. 31, 1896. 15:753.)

Progress on Niagara Falls tunnel. (Eng. news, Jan. 9, 1892. 27:33.)

Progress on power station no. 2 of the Niagara Falls power company. (Eng. news, Oct. 2, 1902. 48:250.)

Projects for the utilization of Niagara. (Engineering. Oct. 23, Nov. 13, Nov. 20, 1891. 52:468–469; 559–562; 589–591.)

Projects for water-power development about Niagara Falls. (Eng. news, Nov. 24, 1892. 28:489.).....X

Pulszky, Francis A, *and* Theresa W. White, red, black; sketches of society in the United States during the visit of their guest (Kossuth). Lond.: Trüebner. 1853. 3:112–127.....IV

Queen Victoria Niagara Falls Park; official documents 1894.....XI

Queen Victoria Niagara Falls Park commissioners. Annual reports, 1885 to date.....XI

R. C. An account of the English and French colonies in North America. (Universal mag. Nov. 1755. 17:218–221.).....V

Rafinesque, Constantine Samuel. A life of travels and researches in North America and the south of Europe. Phila.: For the author by F. Turner. 1836. P. 81.

Rafter, George W. Water resources of the state of New York. Pt. 1. (Water-supply and irrigation papers of the United States geological survey, No. 24. Wash.: 1899. Pp. 24–25, 48, 58–63.) VII

—— Water resources of the State of New York, pt. 2. (Water-supply and irrigation papers of the United States geological survey, No. 25. Wash.: 1899. Pp. 135–143.) X

Ragueneau, Paul. Relation of what occurred in the mission of the Fathers of the Society of Jesus in the Huron country in New France in the years 1647 and 1648. Sent to Rev. Father Estienne Charlet, Provincial of the Society of Jesus in the Province of France. By Father Paul Ragueneau of the same Society, Superior to the Huron mission. (Thwaites, Jesuit Relations, 23: 63.) I

Railway time tables and traveler's guide through Central New York, Niagara Falls, Saratoga Springs, etc. Buffalo: Felton and brother. 1866. Pp. 91–100. XII

Ramsay, *Sir* Andrew C. On some of the glacial phaenomena of Canada and the northeastern provinces of the United States during the drift period. (Proc. Geol. Soc. of London. Quarterly jour. 1859. 15: 200–215.) VII

Rand-McNally. Hand-book to the Pan-American exposition, Buffalo and Niagara Falls . . . Chicago and N. Y.: Rand, McNally. [1901]. Pp. 182–237. XII

Randolph, Isham. Review of the report of William Spencer, M.A., Ph.D., F.G.S., On the physics of the Niagara river. (Ann. rep't of the com'rs for Queen Victoria Niagara Falls park. 1908. 23: 5059.) XI

Rankine, William B. The accomplished utilization of Niagara. (Elec. eng. Jan. 6, 1897. 23: 21.) X

—— The accomplished utilization of Niagara. (Sci. Am. sup. July 10, 1897. 44: 17945.)

—— National cyclopedia of American biography . . . N. Y.: White. 1906. Vol. XIII. Pp. 286–287. X

Rapids of the Niagara above the Falls for the proprietor Hermann J. Meyer. Pub. for Paul Bernard. N. Y. [1854] IX

Rapids of the Niagara Falls. (Grosvenor library, Buffalo, N. Y. Views of Niagara Falls. 1697–187–. Mat 25.) IX

Raumer, Friedrich Ludwig George von. America, and the American people. Tr. by William W. Turner. N. Y.: J. and H. G. Langley. 1846. Pp. 453–456. IV

Raun, George E. A tour around the world. N. Y.: Gottsberger. 1895. Pp. 412–413.....IV

Rawdon, Clark & Co. Niagara, and engraving.....IX

Rebridging Niagara. (Harp. w., July 31, 1907. 41:756, 762.).....XII

Rebuilding Niagara's reservation bridges. (Sci. Am. Sept. 22, 1900. 83:187.).....XII

Recent additions in the power house of the Niagara Falls hydraulic power and manufacturing company. (Am. elec. Dec. 1899. 11:547–551.)

Recent changes at Niagara Falls. (Sci. Am. April 6, 1889. 60:216.).....VII

Recent work of the Cataract construction company. (Nature. May 3, 1894. 50:11.).....X

Recession of Niagara. (Elec. wld. & eng. Mar. 2, 1907. 49: 421.).....XI

Recession of Niagara Falls. (Sci. Am. sup., Sept. 8, 1906. 62: 25651–25653.).....VII

Recession of the Falls. (Ann. rep'ts of the com'rs of the state reserv. at Niagara. Albany: 1889. 5:56–64.).....VII

Recollections of a ramble from Sydney to Southampton, via South America, the West Indies, the United States, and Niagara. Lond.: R. Bentley. 1851. Pp. 320–330.....IV

Redempton of Niagara (The). (Harp. w., July 18, 1885. 29: 460–461.)

Reed, Andrew *and* Matheson, James. A narrative of the visit to the American churches by the deputation from the Congregational union of England and Wales. Lond.: Jackson & Walford. 1835. 1:116–129.....XI

Regulation of Niagara Falls approved (The). (Elec. wld. & eng. Feb. 8, 1913. 61:281.).....XI

Reid, Robert A. One hundred views of the Pan-American Exposition, Buffalo, and Niagara Falls . . . Buffalo: 1901.....XII

Relation des descouvértes et des voyages du sieur de la Salle, seigneur et gouverneur du fort de Frontenac, au delà grands lacs la Nouvelle-France, faits par l'ordre de Monseigneur Colbert.— 1679–1680–1681. (Margry, Découvertes et établissements des Français dans . . . l'Amerique Septentrionale. Tome I, p. 441.).....I

Remarkable phenomenon at Niagara (A). (Cur. lit., May, 1903. 34:538–539.) V

Remington, Cyrus K. Bibliography of Niagara Falls. (Ann. rep'ts of the com'rs of the state reserv. at Niagara. Albany: 1894. 10: 72–107.)

——— List of publications, paintings, maps and engravings relating to Niagara Falls. (Ann. rep'ts of the com'rs of the state reserv. at Niagara. 1895. 11:75–83.)

Replogle, Mark A. Electricity and water power and their interrelations; a popular treatise. N. Y.: Elec. Rev. Pub. Co. 1896. Pp. 132–146 X

Report by the international waterways commission on Niagara Falls. (Eng. news, Apr. 5, 1906. 55:394–395.) XI

Report of the survey to determine the crest lines of the Falls of Niagara in 1890, errata and additional monuments. (Ann. rep'ts of the com'rs of the state reserv. at Niagara. Albany: 1892. 8:64.) VII

[Report on Niagara Falls (A)]. (Eng. news, May 17, 1906. 55:555.) XI

Report on the location and expense of a ship canal around Niagara Falls; also, from the Illinois river to Lake Michigan. With a report of a select committee to the assembly April 14, 1834, relating to the connection from Oswego to the Hudson. N. Y.: Office of the R. R. jour. 1834. Pp. 1–7.....XII

Resume of legislation concerning Niagara power corporations. (Ann. rep'ts of the com'rs of the state reserv. at Niagara. 21:185–213.) XI

Retrocession of Niagara Falls (The). (Eng. news, Dec. 15, 1888. 20:462.) VII

[Review of "Another episode in the history of Niagara Falls," by Joseph William Winthrop Spencer.] (Nature, Dec. 29, 1898. 59:214.).....VII

Review of article of J. W. Spencer — "The Spoliation of the Falls of Niagara." (Nature. Nov. 5, 1908. 79:18.).XI

[Review of Bolton, Reginald Pelham; An expensive experiment.] (Metal. & chem. eng. July, 1913. 11:302.).....X

[Review of George Frederick Wright's article on "The Niagara gorge as a chronometer."] (Sci., May 2, 1884. 3: 556.) VII

Review of G. W. Holley's "The falls of Niagara with supplementary chapter on the other famous cataracts of the world." (Nat., Jan. 4, 1883. 36:32.).....V

[Review of Gilbert's "Rate of recession of Niagara Falls."] (Eng. news. Feb. 28, 1907. 57:248.).....VII

[Review of Holley's "Niagara — its history and geology."] (Pop. sci. mo., Oct., 1872. 1:756–757.)

Review of projects submitted for Niagara competition. (Eng. (Lond.), Oct. 23, 1891. 52:468–469.)

—— (Eng. (Lond.), Nov. 13, 1891. 52:559–562.)

—— (Eng. (Lond.), Nov. 20, 1891. 52:589–591.)

[Review of "The age of Niagara Falls, as indicated by the erosion at the mouth of the gorge," a paper by Prof. G. Frederick Wright, read at the meeting of the A. S., Boston, 1898.] (Nature, Nov. 3, 1898. 59:16.).....VII

[Review of "The battle of Niagara, a poem without notes, and Goldau, or the maniac harper."] (N. Am. rev., Dec., 1818. 8:142–149.).....VIII

Rhine, Alice Hyneman, *ed.* Niagara park illustrated; original and selected descriptions, poems, and adventures . . . N. Y.: Niagara Pub. Co. 1885 c.....XII

Rhodes, Benjamin. Electrical transmission from Niagara. (Trans. A. S. C. E. May, 1885. 14:205–211.).....X

Rice, Roswell. The Falls of Niagara. (*In his* Orations and poems. Springfield: 1883. Pp. 645–646.).....VIII

Richard, John. The conversion of Mr. John Richard related by himself. (U. S. Cath. hist. mag., 1887. 1:94.).....III

Richards, W. C. Niagara in spring. (Harp. Sept., 1865. 31:428.).....VIII

Richardson, Alex. Niagara Falls and water-power. (Good words. (Lond.) Mar., 1896. Pp. 183–189.).....X

Richardson, *Major* John. Eight years in Canada . . . Montreal: H. H. Cunningham. 1847. Pp. 22–25.....VIII

Richardt, Ferdinand. The great international railway bridge. Engraved by D. E. Glover. 1859.....IX

—— Niagara Falls. (From the American shore.) A. H. Payne (sc.). [1859].....IX

—— The Tower. A. H. Payne (sc.). [1859].....IX

Richmond, A. E. Where to invest. Prospect of profit. Is it safe? A treatise on Niagara Falls power as a city builder. Buffalo: 1895.

Ricker, George A. Building the Niagara gorge railway. (Pro., engrs. club, Phila., July, 1899. 16: 248–271.)

Rider, Alex. Geisler, Fr. (sc.) Niagara Wasserfall in seinem gagenwärtigen Zustande, von der Seite von Canada angesehen. Von Alex. Rider nach der Natur. (Grosvenor library, Buffalo, N. Y. Views of Niagara Falls. 1697–187–. Mat 8.) IX

Ridgely, A. S. (Poem) (*In* Holley, G. W., Niagara; its history and geology, incidents and poetry . . . N. Y., Buffalo, Toronto. 1872. Pp. 164–165.) VIII

—— (Poem). (*In* Johnson, R. L., Niagara, its history, incidents, and poetry. Wash.: W. Neale. 1898. Pp. 54–55.) VIII

Rise of Niagara power. (Elec. wld. & eng. Oct., 14, 1905. 46: 654–656.) X

Robb, J. Hampden. Buying Niagara. (Cent., Dec., 1886. 20: 815–823.) XI

Robert, Sr. ——. A part of North America comprehending the course of the Ohio, New England, New York, New Jersey, Pensilvania, Maryland, Virginia, Carolina and Georgia. From the Sr. Robert with improvements. (*In* Brookes, R., The general gazetteer. Lond.: For J. Newberry. 1766.) IX

Robertson, Felix. Additional observations on the Falls of Niagara. (*In* Phila. medical and physical jour. 1: pt. 2, pp. 61–68.) VII

Robertson, William Parish. A visitor to Mexico, by the West India islands, Yucatan and United States, with observations and adventures by the way. Lond.: Simpkin, Marshall and Co. 1853. 2: 437–441 IV

Robinson, Charles Mulford. The life of Judge Augustus Porter, a pioneer in western New York. (Buf. Hist. Soc., pub., 1904. Vol. VII. See index.) V

Robinson, William. [Description of Niagara]. (*In* N. Y. (state) survey.— Special report for 1879. Albany, N. Y.: Van Benthuysen. 1880. Pp. 28–29.) VI

Rochefort, Henri. The adventures of my life. Arranged for English readers by the author and Ernest W. Smith. Lond. and N. Y.: E. Arnold. 1896. 2: 154–155 IV

Roebling, John A. Final report of . . . civil engineer to the presidents and directors of the Niagara Falls suspension and Niagara Falls international bridge companies. May 1, 1855. Rochester, N. Y.: Lee, Mann, & Co. 1855.

Roebling, John A. Report on the condition of the Niagara railway suspension bridge, 1860. (Jour. Frank. inst. Dec., 1860. 70: 361–372.) XII

Roebling, W. A. A reply to the recent criticism made by Edward Wasell upon the Niagara railway suspension bridge. N. Y.: S. B. Leverich. 1877.

Rogers, H. A, Niagara Falls. Bibliography. (New York state library, Albany, N. Y. 1904.)

Rogers, Henry D. On the Falls of Niagara and the reasonings of some authors respecting them. (Am. jour. sci., 1835. 27, No. 2: 326–335.) VII

Rogers, Robert, *Major.* A concise account of North America: containing a description of the several British colonies on that continent. . . . Also of the interior, or westerly parts of the country, upon the rivers St. Lawrence, Mississipi, Christino, and the Great Lakes . . . Lond.: J. Millan. 1765. Pp. 172–174. II

Rohr, Mathias. Am Niagara. (*In his* Gedichte. München. [1905] Pp. 6–8.) VIII

—— Auch am Niagara. (*In his* Gedichte. München. [1905.] P. 92.)

—— Das Opfer des Niagara. (*In his* Gedichte. München. [1905.] Pp. 56–59.) VIII

Rolph, Thomas. A brief account, together with observations made during a visit in the West Indies, and a tour through the United States of America, in parts of the years, 1832–3; together with a statistical account of upper Canada. Dundas, U. C.: Hackstaff. 1836. Pp. 193–204 XI

Rose, A. The emigrant churchman in Canada. Lond.: Rev. Henry Christmas. 1849. 1:131–167. IV

Rose, George. The great country, or, Impressions of America. Lond.: Tinsley Bros. 1868. Pp. 266–271. IV

Rossi, L. A. (inc.) A. Biasoli (acq.) Two views — one of Horse-shoe and one of American Fall. (Grosvenor library, Buffalo, N. Y. 1697–187–. Mat 5.) IX

Rouillard, I——. Carte généralle de la Nouvelle France où est compris la Louisiane, Gaspésie et le Nouveau Mexique avec les mémoires les plus nouveau 1692. I. Rouillard delineavit. L. Boudan sculp. 13 x 19. (*In* Le Celercq, Christian, First establishment of the faith in New France. N. Y.: 1881. 2: 8.) IX

Roy, Camille, *L'abbe.* Etude sur l'histoire de la litterature canadienne, 1800–1820. (Proc. and trans. of the Roy. Soc. of Can. 2d ser. May, 1905. 11:127–130.) VIII

Roy, Jennet. History of Canada . . . Montreal; Ramsey. 1854. Pp. 226–229 V

Russell, *Sir* William Howard. Canada; its defences, condition, and resources; being a third and concluding volume of "My diary, north and south." Lond.: Bradbury and Evans. 1865. Pp. 28–52. . IV

—— My diary north and south. Lond.: Bradbury and Evans. 1863. Vol. II. Pp. 98–106 IV

Sagard-Theodat, Gabriel. Histoire du Canada et voyages que les Freres Mineurs recollects y ont faicts pour la conversion des Infidelles . . . A Paris, Chez Claude Sonnius. 1636. 4 vols.

Sagra, Ramon de la. Cinco meses en los Estados-Unidos de la America del Norte desde el 20 de Abril al 23 de Setiembre de 1835. Diario de viaje. Paris: Pablo Renourd. 1836. Pp. 255–267. . III

Sainson, de, —— (del.) Chute du Niagara. [1836] (Grosvenor library, Buffalo, N. Y. Views of Niagara Falls. 1697–187–. Mat 16.) IX

Sala, George Augustus. My diary in America in the midst of war. Lond.: Tinsley. 1865. 1:163–213 IV

Salem (Mass.) public library. Reading list on Niagara. Bulletin, June, 1901. 6:2. (Bibliography.)

Sangster, A. W. Niagara river and Falls from Lake Erie to Lake Ontario: a series of one hundred and fifty-three original etchings, etched on copper, from his own drawings; ed. by James W. Ward. Buffalo: Fryer. 1886–89 IX

Sansom, Joseph. Sketches of Lower Canada, historical and descriptive; with the author's recollections of the soil, and aspect; the morals, habits, and religious institutions, of that isolated country; during a tour to Quebec, in the month of July, 1817. New York: Kirk and Mercein. 1817. P. 294 III

Sanson, N——. Le Canada, ou Nouvelle France . . . Par N. Sanson d'Abbeville Geographe ordinaire du Roy. A Paris: Chez Pierre Mariette Rue S. Jacque a l'Esperance. Avecq Privilege du Roy, pour vingt ans. 1656 IX

—— Le Canada, ou Nouvelle France . . . Tirée de diverses Relations des François, Anglois, Hollandais . . . Par N. Sanson d'Abbeville. 8½ x 12. (*In his* L'Amérique en plusieurs cartes. Paris: l'autheur. 1657. No. 2 IX

Sanson, N. Canada of Niew Vrankryk. Getroken mit verscheide Fransche, Engelsche en Hollandische Beschryvingen enz. Door N. Sanson de Abbeville. [1657] 8 x 12.....IX

—— ***and*** **G——.** Amérique Septentrionale. Par. N. Sanson. Reveuë et changée en plusieurs endroits suivant les mémoires les plus récents. Par. G. Sanson. 15½ x 22. A Paris: Chez Pierre Mariette. 1669 IX

—— L'Amérique Septentrionale et Méridionale divisée en ses principales parties par les s'rs. Sanson . . . rectifée suivant les nouvelles découvertes . . . aux observations astronomiques, par le sr. Robert. 1749. (Am. maps. Vol. II, No. 23.).....IX

Sanson's map of Canada. (Ann. archaeological rep't, 1897–1898, being part of appendix to the report of the minister of education, Ontario. Toronto: 1898. Pp. 47–49.).....IX

Saron, *Pseud.* A sporting excursion to Niagara and the Canadian lakes. Lond.: 1838.

Sault du Niagara de 135 pieds de haut. Vue. [From "Recueil des plans de l'Amerique Septentrionale. A Paris: chez Sr. le Rouge. 1755 at end].....IX

—— 7 x 10. [n.p. 1733?] (In "Recueil des plans d l'Amerique Septentrionale." A Paris. Chez le Sr Le Rouge. 1755.)

—— [Paris: 1755.] (Grosvenor library, Buffalo, N. Y. Views of Niagara Falls. 1697–1877. Mat 1.).....IX

Saunders, J. E. Niagara. Lond.: Partridge. 1903.....VIII

Saunders, William. Through the light continent; or, The United States in 1877–1878. 2d ed. Lond.: N. Y.: Cassell, Petter, Galpin. 1879. Pp. 24–25.....IV

Savage, James. The whistling swan on Niagara river. (Bull. of the Buf. Soc. of Nat. Sci. 9: No. 1, 23–28.).....VI

Savage, John. At Niagara. (*In his* Faith and fancy. N. Y.: Kirker. 1864. Pp. 61–63.).....VIII

Save Niagara Falls. (Outl., Nov. 25, 1905. 81:696.).....XI

Saving Niagara. (Critic. Mar. 7, 1885. 3(new ser.):109.)..XI

(Saving Niagara Falls) (Sci. Am. Feb. 24, 1906. 94: 171.).....XI

Sayer, Robert. An accurate map of North America, describing and distinguishing the British and French dominions on the great continent according to the definitive treaty concluded at Paris, 10th February, 1763 IX

Scandal at Niagara (The). (Sat. rev., July 28, 1883. 56:106–107.) V

Scanlan, Wallace. "Dirty"; a story of Niagara. (The reminder. Lockport, N. Y.: August, 1896. Vol. I, No. 1.).....VIII

Scene at Niagara Falls — Buying mementos. (Harp. w. June 9, 1877. 21:441.).....V

Scener i Nord-Amerika ur en Svensk Resndes Minnes-Bok. Stockholm: Hos. L. J. Hjerta. 1836. P. 163–190.....III

Scenic Niagara Falls. (Elec., wld. & eng., Feb. 22, 1908. 51: 1908.) XI

Scheme for the electrical utilization of Niagara (A). (Elec. wld. Feb. 9, 1889. 13: 71–72.).....X

Schenk, M. Report on roadway from the reservation to Lake Ontario. (Ann. rep'ts of the com'rs of the state reserv. at Niagara. Albany: 1894. 10:55–56.) XI

Scheufelen, A. The Niagara Falls hydraulic power and manufacturing company. (Zeitschr. d. Ver. Deutschering. Mar. 17, 1900. 44, Pt. 1: 346–349.)

Schlitzer, Frank Cecil. Two views of the Falls from the American shore below. Lithographed by Sage, Sons & Co. Buffalo: 1870..IX

Schneider, Charles C. The cantilever bridge at Niagara Falls and the discussion. (Trans. Am. S. C. E. Nov., 1885. 14:499–606.) XII

Schoolcraft, Henry Rowe. Niagara, an allegory. (*In his* The American Indians. . . . Rochester: Wanzer, Foot. 1851. P. 407.) VIII

—— [Visit to Niagara Falls, 1820] (*In his* Narrative journal of travels through the northwestern regions of the United States extending from Detroit through the great chain of American lakes, to the sources of the Mississippi river . . . in the year 1820.) Albany: E. and E. Horsford. 1821. Pp. 33–47.).....VI

[Schoolcraft, Henry Rowe.] Western scenes and reminiscences; together with thrilling legends and traditions of the red men of the forest. . . . Auburn: Derby and Miller. Buffalo: Derby, Orton and Mulligan. 1853. P. 407.....VIII

Schultz, Christian. Travels on an inland voyage through the states of New-York, Pennsylvania, Virginia, Ohio, Kentucky, and Tennessee, and through the territories of Indiana, Louisiana, Mississippi and New-Orleans; performed in the years 1807 and 1808; including a tour of nearly six thousand miles. N. Y.: Isaac Riley. 1810. 1:54, 58–83.....III and XII

Schumann, I. ——. sc. Total Anblick des Niagara Falls. (Grosvenor library, Buffalo, N. Y. Views of Niagara Falls. 1697–187—. Mat 3.) IX

Schuster, S. ——. Niagara Falls. [1870?] (Grosvenor library, Buffalo, N. Y. Views of Niagara Falls. 1697–187—. Mat 21.).IX

Scott, C. F. The installation of the Niagara Falls power company. (Proc. Engineer's club of Phila. July-Sept. 1897. 14:127–153.)

Scovell, J. T. An old channel of the Niagara river. (Proc. A. A. A. S. Aug. 1890. 39:245–246.) [Abstract.] VII

Seale, R. W. (del. and sc.) An accurate map of Canada, with the adjacent countries, exhibiting the late seat of war between the English & French in those parts. (anon.) 10 x 13½. (*In the* Universal mag. Lond.: J. Hinton. Feb. 1761. 28: opp. p. 57.) IX

—— (sc.) A new and accurate map of North America laid down according to the latest and most approved observations and discoveries. (anon.) 10 x 13. (*In the* Universal mag. Lond.: J. Hinton. Mar. 1763. 32: opp. p. 113.) IX

Season at Niagara Falls (The). (Photographic visitors.) Drawn by J. Wells Champney. (Harp. w. Aug. 18, 1877. 21:645–646.) IX

Seaver, James E. A narrative of the life of Mrs. Mary Jemison. Canandaigua: J. D. Bemis and Co. 1824. Pp. 145–149.....V

Secretary of war's decision on Niagara Falls (The). (Elec. wld. and eng. Mar. 2, 1907. 49:414.) XI

Sectional view of one of the 13,000 horse-power turbines at the 125,000 horse-power plant of the electric development company. (Sci. Am. Oct. 21, 1905. 93:313.)

Seeing the Falls in company. (Outlook. May 27, 1911. 98: 147–150.)

Sellers, Coleman. How Niagara's power will be utilized. (Eng. mag. Sept. 1891. 1:803–817.)

—— The utilization of the power of Niagara Falls and notes on engineering progress. (Jour. Frank. inst. July 1891. 132:30–53.)...X

Senex, John. A new map of the English empire in America . . . revised by John Senex. 1710. (*In* A new general atlas. Lond.: Daniel Brown. 1721. P. 237.) IX

—— North America. Corrected from the observations communicated to the Royal Society at London, and the Royal Academy at Paris, by John Senex. 1710.....IX

Senex, John. North America, corrected from the observations communicated to the Royal Society at London, and the Royal Academy at Paris, by John Senex. 1710. (Maps of America. Vol. III. No. 14.) IX

Severance, Frank Hayward. The achievements of Captain John Montresor on the Niagara, and the first construction of Fort Erie. (Pub. Buf. Hist. Soc. 5:1–19.) XII

—— Adventures of M. Bonnefons, 1753. (*In* Severance, Studies of the Niagara frontier. Pp. 335–339.) I

—— The Columbian year book. Niagara Falls and Buffalo, N. Y. Published by J. C. Prescott, excursion manager, Erie lines. Buffalo: 1893 XII

—— Historical sketch of the board of trade, the merchants exchange, and the chamber of commerce of Buffalo. (Pub. Buf. Hist. Soc. 1909. 13:311–313.) XII

—— How to see Niagara. Railway guide and illustrated hand-book of Buffalo, Niagara Falls and vicinity. Matthews, Northrup and Co. June 1888. Pp. 35–37.....XII

—— A new guide to Niagara Falls and vicinity. . . . Chicago and N. Y.: Rand, McNally. 1892. P. 1–124.....XII

—— Niagara in London: a brief study from many standpoints. Buffalo: 1887.....XII

—— Niagara and the poets. (*In his* Old trails on the Niagara frontier. 1st ed. Buffalo: 1899; 2d ed. Cleveland: 1903. Pp. 221–260.) VIII

—— The story of Joncaire, his life and times on the Niagara. Buffalo: 1906. Passim.....XII

Seyrig, William. L'utilisation du Niagara. (Le Genre civil. Feb. 4, 1893. 22:224–226.).....X

Shaler, Nathaniel Southgate. Aspects of the earth. N. Y.: Scribner. 1889. Pp. 161–163.....VII

Sharan, James. The adventures of James Sharan: compiled from the Journal, written during his voyages and travels in the four quarters of the globe. Balt.: Dobbin and Murphy. 1808. Pp. 108–116. .II

Sharpe, William. Niagara and Khandalla, and other poems. Lond.: H. A. Copley. 1902.....VIII

—— The international temple of Niagara. Reprinted from *Modern thought.* March. 1882. Lond.: Modern press. N.d.....V and XI

Shaw, John. A ramble through the United States, Canada, and the West Indies. Lond.: J. F. Hope. 1856. Pp. 32–36.....IV

[Shelton, F. W.] Verses written during a thunder storm in the album at the Falls. (*In his* The trollopiad; or, Travelling gentlemen in America; a satire by Nil Admirari, esq. N. Y.: Shepard. 1836. Pp. 79–81.) VIII

Shirreff, Patrick. A tour through North America; together with a comprehensive view of the Canadas and United States as adapted for agricultural emigration. Edinb.: 1835. Pp. 88–94.....XII

Shooting Niagara Falls. (Critic. Jan. 1883. 100:122–127.) VIII

—— Eclec. mag. Jan. 1883. New ser. 37:122–127.....VIII

Shooting the rapids. (Harp. w., Sept. 15, 1883. 27:584.)...V

Shrade —— (sc.) Chute du Niagara. [1860?] (Grosvenor library, Buffalo, N. Y. Views of Niagara Falls. 1697–187—. Mat 18.) IX

Siemens, *Sir* Carl Wilhelm. Inaugural address; delivered at the annual general meeting of the Iron and steel institute held in London, March, 1877. Newcastle-upon-Tyne.: Lambert. 1877. Pp. 12–13 X

Significance of the hydro-electric developments at Niagara Falls. (Elec. rev. Feb. 11, 1905. 46:224–225.).....X

Sigourney, *Mrs.* Lydia H. Farewell to Niagara. (*In* Barham, William, Descriptions of Niagara; selected from various travellers. . . . . Gravesend: n. d. Pp. 179–180.).....VIII

—— The hermit of the Falls. (*In her* Illustrated poems. Phila.: Lindsay and Blakiston. 1860. Pp. 143–149.).....VIII

—— The hermit of the Falls. (*In* Barham, William, Descriptions of Niagara; selected from various travellers. . . . Gravesend: n.d. Pp. 142–146.).....VIII

—— The hermit of Niagara. (Graham's Am. mo. mag., Feb. 1848. 32:127–128.) VIII

—— Niagara. (*In her* Illustrated poems. Phila.: Lindsay and Blakiston. 1860. Pp. 134–136.).....VIII

—— Niagara. (*In her* Select poems. 5th ed. Phila.: Biddle. 1847. Pp. 88–90.) VIII

—— Niagara. (*In* Barham, William, Descriptions of Niagara; selected from various travellers; . . . Gravesend: n.d. Pp. 111–117.) VIII

—— Niagara. (*In* Barham, William, Descriptions of Niagara; selected from various travellers. . . . Gravesend: n.d. Pp. 159–161.) VIII

Sigourney, *Mrs.* Lydia H. Scenes in my native land. Boston: James Munroe and Co. 1845. Pp. 3–20; 148–161; 317–318 VIII

Silliman, Augustus E. A gallop among American scenery; or, Sketches of American scenes and military adventure. N. Y.: D. Appleton. 1843. Pp. 148–154.....IV

Simcoe, *Mrs.* E. P. G. Niagara paintings. (*In her* Diary of Mrs. John Graves Simcoe. . . . Toronto: Briggs. 1911.)....II and IX

Sinclair, John. Sketches of old times and distant places. Lond.: Murray. 1875. Pp. 244–255.....IV

Sketches of scenery on Niagara river for the North American journal. (N. Am. rev., Mar. 1916. 2: 320–329.).. ...V

Sladen, Douglas Brooke Wheelton. To the American Fall at Niagara. (*In* Sladen, Douglas, ed., Younger American poets 1830–1890. . . . With an appendix of younger Canadian poets; ed. by G. B. Roberts. Lond. and Sydney: Griffith, Farran, Okeden and Welsh. 1891. Dedicatory sonnet.).....VIII

(Small, H. B. *comp.*) The Canadian handbook and tourist's guide. . . . Montreal: Longmore. 1867. Pp. 170–185.....XII

Smith, Cecil B. Construction of Canadian Niagara power company's one hundred thousand horse-power hydro-electric plant at Niagara Falls, Ont. (Trans. Can. Soc. C. E. Jan. 1905. 19:62–82....X

—— Hydro-electric power plants in the Canadian Niagara district. (Eng. mag. Feb. 1905. 28: 727–752.).....X

Smith, Erminnie A. A Seneca legend of Hinu^{n} and Niagara. (*In her* Myths of the Iroquois. Pp. 54–55.) (Second ann. rep't of the bureau of ethn. to the sec'y of the Smith. inst. 1880–81. By J. W. Powell, Director. Wash.: Gov't print. off. 1883.).....VIII

Smith, Michael. A geographical view of the British possessions in North America. . . . Balt.: P. Mauro. 1814. Pp. 62–74...III

—— Geographical view of the province of Upper Canada; and promiscious remarks on the government; in two parts; with an appendix, containing a complete description of the Niagara Falls. N. Y. Pelsue and Gould. 1813. Pp. 72–82.....V

Smith, Thomas. The wonders of nature and art; or, A concise account of whatever is most curious and remarkable in the world: . . . London: J. Walker, etc., 1804. 9: 219–223.....V

Smith, William. A Yorkshireman's trip to the United States and Canada. Lond.: Longmans, Green. 1892. Pp. 230–247.....IV

Smith, William Henry. Canada: past, present and future; being a historical, geographical, geological and statisical account of Canada west. Toronto: (1851). 1:198–204.....VII

Southesk, James Carnegie, *Earl of*. Saskatchewan and the Rocky mountains; a diary and narrative of travel, sport and adventure, during a journey through the Hudson's Bay company's territories in 1859 and 1860. Edinb.: Edmonton & Douglas. 1875. Pp. 3–4.....IV

Southack, ——. A new chart of the British empire in North America; with the distinct colonies granted by letters patent from cape Canso to St. Matthias river. 1746.....IX

Souvenir of Niagara Falls. N.p. [18—?] (Fourteen folded plates.)

Souvenir of Niagara Falls, with a series of views in oil colors, from photographs taken on the spot (A). Buffalo: Sage. 1864.....XII

Souvenir history of Niagara county, New York; commemorative of the twenty-fifth anniversary of the pioneer association of Niagara county. 1902. P. 180 ff.

Spafford, Horatio Gates. Gazetteer of the State of New York. . . . Albany: H. C. Southwick. 1813. Pp. 258–259.....V

Spectator (The). (Outl., May 27, 1911. 98:147–152.).....IV

Spencer, Caroline. Journal — A trip to Niagara in 1835. (Mag. Am. hist., Oct., 1889. 27:231–242.).....III

Spencer, Joseph William Winthrop. Age of Niagara Falls. (Am. geologist. August, 1894. 14:135–163.).....VII

—— Age of Niagara river. (Am. nat., March, 1887. 21: 269–270.).....VII

—— An account of researches relating to the great lakes. (Ann. rep'ts of the com'rs of the state reserv. at Niagara. N. Y. and Albany: 1899. 15:139–159.).....VII

—— Another episode in the history of Niagara Falls. (Am. jour. sci., Dec. 1898. 156 (ser. 4, 6): no. 36, 439–450.).....VII

—— Changes in the recession of the Falls of Niagara. (Science. New ser. Sept. 18, 1908. 28: 283–284.).....VII

—— The duration of Niagara Falls. (Am. nat. Oct. 1894. 28: 859–862.).....VII

—— Duration of Niagara Falls. (Am. jour. sci. Dec. 1894. 148 (ser 3, 48): 455–472.).....VII

—— The duration of Niagara Falls and the history of the great lakes. . . . 2d ed. N. Y.: Humboldt. (1895) Pp. 99–117.....VII

Spencer, Joseph William Winthrop. Duration of Niagara Falls and the history of the Great Lakes. 2d ed. (Ann. rep'ts of the com'rs of the state reserv. at Niagara. Albany: 1895. 126 pages.) . . VII

—— The duration of Niagara Falls and the history of the great lakes. (*In* N. Y. (state) Assembly docs. 118th sess. 1895. No. 90 app.) VII

—— Falls of Niagara: their evolution and varying relations to the Great Lakes; characteristics of the power and the effects of its diversion. (Can. dep't of mines, geol. survey branch. Ottawa: S. E. Dawson. 1907.) VII

—— Interruption in the flow of the Falls of Niagara in February, 1909. (Geol. Soc. of Am. bull. Aug. 10, 1910. 21:447–448.) VII

—— L'évolution des chutes du Niagara. (La Géographie. 5 Aout. 1910. tome 22, No. 2. Pp. 105–118.) VII

—— A map of the gorge of the Niagara river, to accompany a report on New discoveries in the physics of the Falls. 1905. (*In back of his* "Outline of the evolution of the falls of Niagara: contrast with the falls of Zambesi;" for the International Zoological Congress.) . . IX

—— Niagara Falls as a chronometer of geological time. (Proc. Royal Soc. of London. March 6, 1894. 56:145–148.) [Abstract.] VII

—— Niagara as a time-piece. (Pop. sci. mo. May, 1896. 49: 1–19.) VII

—— Niagara as time-piece. (Proc. of the Can. inst., new ser. May 1898. 1: pts. 4 and 5. 101–103.) VII

—— On the relationship of Niagara river to the glacial world. (Science. n.s. Aug. 5, 1910. 32:191.) [Abstract.] VII

—— On the relative work of the two falls of Niagara. (Science. n.s. Aug. 5, 1910. 32:187–188.) VII

—— Outline of the evolution of the Falls of Niagara; contrast with the falls of Zambesi;" for the International Zoological Congress.) . . IX

inc. 1913 VII

—— Partial drainage of Niagara river to the glacial period. (Science. n.s. Aug. 5, 1910. 32:191.) [Abstract.] VII

—— Recession of the Niagara Falls. (Brit. Assn. for A. S. Report 77th meeting. 1908. Pp. 572–575.) [Abstract.] VII

—— Recession of the Niagara Falls. (Geol. mag. Decade 5. 1907. 4:440–441.) VII

—— Relationship of Niagara river to the glacial period. (Geol. Soc. of Am. bul. 1910. 21:433–440. Discussion, 21:763–764.) . . VII

Spencer, Joseph William Winthrop. Relative work of the two Falls of Niagara. (Geol. Soc. of Am. bul. Aug. 10, 1910. 21: 441–446.) VII

—— (Report on) Niagara Falls and Niagara district. (Can. geol. survey. Summary report. 1905. Pp. 87–91.) VII

—— Review of the history of the great lakes. (Am. geol. Nov. 1894. 14: 289–301.) VII

—— Revision of the age of Niagara Falls. (Science. n.s. June 12, 1908. 27: 925–926.) VII

—— Side issues bearing on the age of Niagara Falls. (Science. n.s. Nov. 27, 1908. 28: 754–759.) VII

—— Soundings in Niagara gorge and under the Falls. (Sci. Am. Aug. 1, 1908. 99: 76–77.) VII

—— Soundings under Niagara Falls and in the gorge. (Science. n.s. April 10, 1908. 27: 587–589.) VII

—— Spoliation of the Falls of Niagara. (Pop. sci. mo. Oct. 1908. 73: 289–305.) XI

Spencer, O. M. Narrative of O. M. Spencer; comprising an account of his captivity among the Mohawk Indians, in North America. Revised from the original papers by the author of "Moral and scientific dialogues." Lond.: J. Mason. 1836. Pp. 234–235.....V

Springs, water-falls, sea-bathing resorts and mountain scenery of the United States and Canada: . . . N. Y.: J. Disturnell. 1855. Pp. 106–113.....XII

Stansbury, Philip. A pedestrian tour of two thousand three hundred miles, in North America. To the Lakes,— the Canadas,— and the New England States. Performed in the autumn of 1821. N. Y.: Meyers and Smith. 1822. Pp. 100–114.....III

State of New York. Report of the Regents of the University on the boundaries of the state of New York. Albany: Argus. 1874. 1:104–105 V

State reservation at Niagara Falls; testimony in appraisement proceedings (The). 2 vols. No publisher. N.d.....XI

Status of the Niagara Falls bill. (Elec. wld. Feb. 15, 1913. 61: 336.) XI

Steamer goes safely past Niagara whirlpool (A). (Knowl. Aug. 10, 1883. 4:90–91.)

Steele, Eliza R. A summer journey in the West. N. Y.: S. Taylor. 1841. Pp. 54–65.....IV

Steele's Niagara Falls port-folio, containing eight new views of Niagara Falls taken from the most striking points. Also a facsimile of a view taken by Father Hennepin, in 1678. Lithographed by Hall and Mooney. Buffalo: Steele's press. 1844. IX

Steele's book of Niagara Falls. 7th ed. Carefully rev. and imp. Buffalo: Oliver G. Steele. 1840. XII

Steele's Niagara guide book; being a synopsis of Steele's book of Niagara Falls . . . Buffalo: Steele. 1840. XII

Steele & Co. Lithographs of the American Fall from Goat Island and of the Horseshoe Fall from Goat Island. 1838. IX

Steinwehr, A. W. A. F., *Baron von.* The centennial gazetteer of the United States . . . Phila.: McCurdy. (1873) Pp. 646–647 V

Stetson, Francis Lynde. Private rights in Niagara Falls. (Outl. Feb. 16, 1907. 85: 378–379.) XI

—— The use of the Niagara water power. (Cass. July, 1895. 8:173–192.) X

Stevens, Abel. Life and times of Nathan Bangs, D.D. N. Y.: Carlton and Porter. [1863]. P. 35. V

Stillwell, Lewis Buckley. Electric power generation at Niagara. (Cass. July, 1895. 8: 253–304.) X

—— The electric transmission of power from Niagara Falls. (Trans. Am. inst. elec. engrs. Buffalo: Aug. 23, 1901. 17: 445–544.) . . X

Stoddard, John L. Lectures. Bost.: Balch. 1902. Suppl. 2: 131–143 V

Stone, William Leete. From New York to Niagara. Journal of a tour, in part by the Erie canal, in the year 1829. (Pub. Buf. Hist. Soc. 1910. 14: 238–250.) . . . . . III and XII

Stonebridge, G. E. Through Niagara whirlpool rapids in a boat. (Sci. Am., July 28, 1900. 83:59.) V

Strathesk, John, *pseud.* Bits about America. Edinb.: Oliphant, Anderson and Ferrier. 1887. Pp. 116–129. XI

Stratemeyer, Edward. Marching on the Niagara, or, The soldier boys of the old frontier. Boston: Lee and Shepard. (Colonial series II) 1902. VIII

Street, Alfred Billings. Frontenac; a poem. Lond.: Richard Bentley. 1849. Pp. 157–158. VIII

Strengthening the cantilever bridge at Niagara. (Sci. Am. Oct. 20, 1900. 83: 249–250.) XII

Strickland, Agnes, *ed.* Twenty-seven years in Canada west; or The experience of an early settler. By Major Strickland. Lond.: R. Bentley. 1853. 2:247–258.....IV

Strother, French. Shall Niagara be saved. (Wld's work. May, 1906. 12:7524–7535.).....XI

Stuart, Charles Beebe, *and* Serrell, E. W., Engineers' report on the Niagara ship canal, made to the commissioners appointed by the legislature of New York . . . N. Y.: Baker, Goodwin & Co. ptrs. 1854.

Stuart, James. Three years in North America. Third edition, revised. Edinb.: Robert Cadell; Lond.: Whittaker and Co., 1833. 1:138–145.....III and XII

Stuart-Wortley, *Lady* Emmeline Charlotte Elizabeth (Manners). Travels in the United States . . . during 1849 and 1850. Lond.: Bentley. 1851. Pp. 18–30.....IV

Sturge, Joseph. A visit to the United States in 1841. Lond.: Hamilton, Adams. 1842. P. 111.....IV

Sullivan, *Sir* Edward Robert. Rambles and scrambles in North and South America. Lond.: Richard Bentley. 1852. Pp. 42–45..IV

Sulte, Benjamin. Le Fort de Frontenac, 1668–1678. (Royal Soc. of Can. proc. and trans., May, 1901. 2d ser. sec. I, 7:95–96.)..V

—— Le Haute-Canada avant 1615. (Royal Soc. of Can. June, 1904. 2d ser., sec. I, 10:64, 67, 68, 73–83.).....V

—— The valley of the Grand river, 1600–1650. (Royal Soc. of Can. proc. and trans., May, 1898. 2d ser. 4:109.).....V

Summary of conclusions of Sir William Thompson in his British association address. (Nature, Sept., 8, 1881. P. 435.)

[Summary of electrochemical industry at Niagara Falls.— Fitzgerald in Electro-chem. & metal. ind. July, 1905.] (Elec. wld. and eng. July 15, 1905. 46:108.)

Summary of Mr. Lyell's memoir on the Falls . . . (Proc. Geol. Soc. of London. 1842–43. 4:19–22.).....VII

Suplee, Henry H. An interesting hydraulic power plant. (Cass. Nov., 1894. 7:85.).....X

Suspension bridge at Niagara Falls. (Grosvenor library, Buffalo, N. Y. Views of Niagara Falls. 1697–187—. Mat 16.)..IX

Sutcliff, Robert. Travels in some parts of North America in the years 1804, 1805, & 1806. Phila.: B. and T. Kite. 1812. Pp. 149–155.....VII

Sweetser, M. F., *ed.* The middle states; a handbook for travellers . . . 4th ed. Bost.: Osgood. 1881. Pp. 177–186.....XII

Symons, Thomas W. The United States government and the New York state canals. (Pub. Buf. Hist. Soc. 1909. 13: 131–133.).XII

System of the International traction company of Buffalo, N. Y. (St. ry. rev. Dec. 15, 1899. 1: 815–822.)

Szuts, Bela. The utilization of Niagara Falls; scheme by Messrs. Ganz. (Eng. (Lond.), Feb. 19, 1892. 53: 228–230.).....X

T. C. A ride to Niagara. (The portfolio. July, Aug., Sept. 1810.) XII

T. R. H. Electrically utilized power at Niagara Falls. (Science. n.s. 1903. 17:236–237.)

Tabb, John B. Niagara. (Atlantic. Sept., 1896. 78: 403.).VIII

Table rock album and sketches of the Falls and scenery adjacent. 3d ed. Buffalo: Jewett, Thomas and Co. 1850....VIII

—— Buffalo: Thomas and Lathrops. 1855.....VIII

—— Buffalo: E. R. Jewett. 1859.....VIII

Talbot, Edward Allen. Five years residence in the Canadas; a tour through part of the United States of America, in the year 1823. Lond.: Longman, Hurst, Rees, Orme, Brown, and Green. 1824. 1:123–140 VI

Tanner, Henry S. The American traveler or guide through the United States. Phila.: Author. 1834. Pp. 86–87.....XII

Tappan, William B. Niagara. (*In his* Poet's tribute; poems of William B. Tappan. Bost.: King, Crocker and Brewster. 1840. P. 30.) VIII

Tattersall, O. The destruction of the Caroline steamboat by fire, at the Falls of Niagara, Upper Canada, on the night of Friday, the 29th Dec. 1837. Engraved by J. Harris. Lond.: R. Ackermann. 1838 IX

Taylor, Bayard. The chiropodist: a story of the watering places — III — Niagara. (Harp. w., 24:465–466.).....VIII

—— Home and abroad; a sketch-book of life, scenery, and men. N. Y.: G. P. Putman. 1860. P. 483.....IV

Taylor, Frank Bursley. Changes of level in the region of the great lakes in recent geological time. (Am. jour. sci. Jan., 1895. Ser. 3. 49:69–71.) VII

—— Niagara and the Great Lakes. (Am. jour. sci., Apr., 1895. 149: 249–270.) VII

Taylor, Frank Bursley. Origin of the gorge of the whirlpool rapids at Niagara. (Bull. Geog. Soc. Amer. 1898. 9:59–840.) . . .VII

Taylor, Isaac, *Rev.* Scenes in America, for the amusement and instruction of little tarry-at-home travelers. Lond.: Harris. 1821. Pp. 101–103 V

Temporary shut-down of Niagara Falls power. (Elec. wld., June 13, 1908. 51:1268.)

Terreni, G. M. Caduta de Niagara. 9½ x 7. (*In* Atlante dell' America. [anon.] Liverno: Presso Gio Tomasso Masi, e comp. con approvazione. 1777. No. 6.) IX

—— Caduta di Niagara. G. M. T. (sc.) 9½ x 7¼. (*In* Il Gazzettiere Americano. Liverno. M. Coltellini. 1763. 3:5.) . .IX

—— Caduta di Niagara. G. M. T. fecit. (Grosvenor library, Buffalo, N. Y. Views of Niagara Falls. 1697–187–. Mat 2.) .IX

Test of the maximum capacity of the Niagara Falls tunnel. (Sci. Am., Dec. 6, 1902. 87: 372.)

Thayer, Eugene. Music of Niagara. (Scribner mo. Feb., 1881. 21: 583–586.) VIII

—— Music of Niagara. (Sci. Am. sup., Mar. 7, 1896. 41: 16837.) VIII

Thomas, *Rev.* Abel C. Autobiography. Boston: J. M. Usher. 1852. Pp. 211–213.....III

Thompson, Sylvanus Phillips. Life of William Thompson, baron Kelvin of Largs. Lond.: Macmillan. 1910. 2 vol. (See index to volume 2 under Niagara.) X

—— Utilizing Niagara. (Sat. rev., Aug. 3, 1895. 80:134–135.) X

Thompson, Edward William. John Bedell, United States loyalist. (*In his* Old Man Savarin and other stories. N. Y. and Boston: T. Y. Crowell & Co. [c 1895] Pp. 251–270.) VIII

Thornton, John, *Major.* Diary of a tour through the northern states of the Union and Canada. Lond.: 1850. Pp. 26–36.....IV

Thorold, *Rev.* A. W. To Niagara. Pt. 1. (Good words. 1875. 16: 63–69.) IV

—— To Niagara and back. Pt. 2. (Good words. 1875. 16: 125–131.) IV

Thoughts at Niagara. (Knicker., Sept., 1843. 22: 193–195.)

Thoughts on visiting Niagara. (*In* Holley, G. W., Niagara; its history and geology, incidents and poetry . . . N. Y., Buffalo, Toronto. 1872. Pp. 157–158.) VIII

Three sisters, Niagara river above the Falls (The). (Grosvenor library, Buffalo, N. Y. Views of Niagara Falls, 1697–187–. Mat 23.) IX

Three views in colors from "The Falls of Niagara" (guide-book) 1860. (Grosvenor library, Buffalo, N. Y. Views of Niagara Falls. 1867–187–. Mat 15.) IX

Through Niagara whirlpool rapids in a boat. (Sci. Am. July 28, 1900. 83: 59.)

Through the gorge of Niagara. Photo-gravures. N. Y.: The Albertype Co. 1896.

Thunstrom, Louis L. How to save Niagara. (Sci. Am., July 8, 1905. 93: 27.) XI

Ticknor, George. Life, letters, and journals of George Ticknor. . . . 12th ed. Bost.: Houghton, Mifflin. 1: 386. 2: 221, 225, 277, 281 IV

To save the Horseshoe fall. (Lit. dig. Jan. 20, 1917. 54: 123–124.)

Tonty, Henri de. Entreprises de M. de la Salle de 1678 a 1683. Relation écrite de Quebec, le 14 novembre 1684, par Henri de Tonty. (Margry, Decouvertes et etablissements des Français dans . . . de l'Amerique Septentrionale. Tome I, p. 577.)

Tour through parts of the United States and Canada. By a British subject. Lond.: Longman, Rees, Orme, Brown, and Green. 1828. Pp. 96–103 III

Tourist or pocket manual for travellers on the Hudson river, the western canal, and stage road, to Niagara Falls (The) . . . 2d ed. enl. and imp. N. Y.: Ludwig and Tolefree. Pp. 59–61 XII

Tourist's guide to Niagara Falls, Lake Ontario, and St. Lawrence river . . . N. Y.: Disturnell. 1857c. Pp. 1–26. . XII

Townsend, Frederick Trench. Ten thousand miles of travel, sport, and adventure. Lond.: Hurst and Blackett. 1869. Pp. 57–59 IV

Transatlantic rambles; or, A record of twelve months' travel in the United States, Cuba, and the Brazils. By a Rugbean. Lond.: George Bell. 1851. Pp. 20–23.

Transformation of Niagara power into three-wire direct current by the Buffalo general electric company (The). (Am. electn., Feb., 1900. 12: 59–67.)

Transformers for the Niagara Falls — Buffalo transmission. St. ry. rev. Dec. 15, 1896. 6:784–785.)

Transmission of electricity from Niagara Falls to Buffalo. (Eng. news, Aug. 13, 1896. 36:96.)

Transmission of power from Niagara Falls to Buffalo completed. (Pub. opin., Dec., 1896. 21:723.)

Traveler's guide, and illustrated description of central New York, Niagara Falls, Saratoga Springs, etc., together with railroad time tables. Buffalo: Felton and Brother. 1866. Pp. 43–52 XII

Travels in North America. Dublin: Brett Smith. 1824. Pp. 122–125 VIII

Treaty for the control of international waterways (A). (Eng. news, June 9, 1910. 63:661–662.) XI

Trip through the lakes of North America (A) . . . N. Y.: J. Disturnell. 1857. Pp. 206–217 XII

Trip to Niagara (A). By a Washingtonian. (So. lit. messenger, Nov., 1827. 3:657–664.) ..... V and XII

Trolley-car bridge at Niagara. (St. ry. rev. Mar. 15, 1896. 6:169.)

Trolley to cross Niagara. (St. ry. rev. Feb. 15, 1896. 6: 109.) X

Trollope, Anthony. North America. Lond.: Chapman and Hall. 1862. 1:136–152 IV

Trollope, Frances Milton. Domestic manners of the Americans. Lond.: Whittaker, Treacher. 1832. Pp. 302–309 III

[Trotter, Isabella Strange.] First impressions of the new world on two travelers from the old in the autumn of 1858. Lond.: Longman, Brown, Green, Longmans, Roberts. 1859. Pp. 50–61 V

Trowbridge, John. Niagara Falls considered as a source of electrical energy. (Sci., May 15, 1885. 5:401–403.) X

—— Niagara, the motor for the World's Fair. (Chaut. Jan., 1892. 14:441–445.) X

Trudell, Irvington. The seven wonders of the New World. 1. Niagara Falls. (Nat. mag. Boston: August, 1897. 6:461–468.)

True and wonderful story of Paul Gasford at the Falls of Niagara (The). N. Y.: Mahlon Day. 1830.

Trumbull, William. The legend of the white canoe. N. Y. & Lond.: Putnam. 1894 VIII

Tudor, Henry. Narrative of a tour in North America comprising Mexico, the mines of Real del Monte, the United States, and the British colonies, with an excursion to the Island of Cuba. In a series of letters written in the years 1831–1832. Lond.: James Duncan. 1834. 1:235–268 III

Tugby's illustrated guide to Niagara Falls . . . Niagara Falls, N. Y.: Thomas Tugby. 1885.....XII

Tunis' illustrated guide to Niagara. Rev. and pub. by H. T. Allen. Buffalo: Courier. 1879.....XII

Tunis's topographical and pictorial guide to Niagara; containing, also, a description of the route through Canada, and the great northern route, from Niagara Falls to Montreal, Boston, and Saratoga Springs . . . Niagara Falls: W. E. Tunis. 1855.....XII

Tupper, Martin Farquhar. Niagara. (*In* Holley, George W., Niagara; its history and geology, incidents and poetry . . . N. Y., Buffalo, Toronto. 1872. P. 163.).....VIII

Turbines of the Ontario power company, Niagara Falls. (Elec. wld. & eng. April 11, 1905. 45:652.).....X

Tuttle, W. E. Electricity at Niagara Falls. (Elec. wld., Mar. 7, 1896. 27:256.) X

Twain, Mark. Extracts from Adam's diary translated from the original Ms. N. Y. and Lond.: Harper and Brothers. 1904...VIII

Two aspects of "conservation." (Metal. & chem. eng. Sept. 12, 1912. 10:574.).....X

(Two letters to the editor on the Niagara problem.) (Sci. Am. Mar. 31, 1906. 94:271.).....XI

Tyndall, John. Fragments of science; a series of detached essays, addresses, and reviews. 6th ed. D. Appleton & Co. N. Y.: 1889. Pp. 218–245.

—— Niagara. (Every Sat., May 31, 1873. 14:595–601.) .VII

—— Niagara. (Lit. liv. age, June 7, 1873. 117:609–619.) ..VII

—— Niagara. (Macmill. May, 1873. 28:49–62.).....IV

—— Some observations on Niagara. (Royal inst. of Great Britain. Proc. 1873. 7:73–91.)

—— Niagara Falls. (Critic, July, 1873. 81:24–35.).....VII

—— Niagara Falls: past and future. (*In* Williams, J. David, *ed.*, America illustrated. N. Y.: The Arundel print. n.d. Pp. 81–85.) VII

—— Some observations on Niagara. (Pop. sci. mo., June, 1873. 3:210–226.) VII

Underwood *and* Underwood. Map of Niagara Falls. 8 x 9½. 1901 IX

U. S. Congress — Committee on Foreign Affairs. Hearing; Preservation of Niagara Falls. Jan. 16, 18, 19, 20, 23, 26, and 27, 1912. Wash.: Gov't print. off. 1912.....XI

U. S.— Foreign relations committee (Senate.) . . . Preservation of Niagara Falls . . . Hearings before the committee on foreign relations . . . [April 11, 1906.] Wash.: Gov't print. off. 1906. U. S. 59th Cong., 1st sess. Senate doc. 393. Serial 4015.).....XI

U. S. Congress. House committee on foreign affairs. Diversion of water from the Niagara river . . . Hearings before the committee Jan. 24, Feb. 15, & 17, 1913 . . . Wash.: Gov't print. off. 1913..X

U. S.— Forest reservations and protection of game committee (Senate.) Preservation of Niagara Falls. Report by Mr. Brandagee from the committee on forest reservations and protection of game, favoring H. J. Res. 83, similar to S. J. Res. 24, for report upon the preservation of the Falls. March 9, 1906. (U. S. 59th Cong., 1st sess. Senate rep't 1611; serial 3904.).....XI

U. S. Congress. House committee on foreign affairs. Diversion of water from the Niagara river. Hearings before the committee on foreign affairs Jan. 22–(24) 1913, on bill proposed by the sub-committee on Niagara Falls legislation dated Jan. 15, 1913. Pt. I [–2] Wash.: Gov't print. off. 1913.....X

—— House committee on foreign affairs. Diversion of water from the Niagara river. Hearings . . . 63d Cong., 2d sess. Jan. 16, 1914. Wash.: Gov't print. off. 1914.....X

—— **House committee on foreign affairs** . . . Diversion of water from Niagara river. 63d Cong., 2d sess. . . . Report to accompany House report 16542. Wash.: Gov't print. off. 1914..X

U. S.— Preservation of Niagara Falls conference committee. Preservation of Niagara Falls. Conference report on H. 18024, for control and regulation of waters of Niagara river [and] preservation of the Falls. (June 25, 1906. U. S. 59th Cong., 1st sess. House rep't 5005; serial 4908.).....XI

U. S. Congress. Report of the deep waterways commission prepared at Detroit, Michigan, December 18–22, 1896, by the commissioners, James B. Angell, John E. Russell, Lyman E. Cooley, accompanied by a report on technical work and several topical reports and drawings pertaining thereto. Wash.: 1897. H. R. doc. 92. 54th Cong., 2d sess XI

U. S.— Rivers and harbors committee. (House.) Control and regulation of waters of Niagara river, preservation of Niagara Falls, etc. Report by Mr. Burton from the committee on rivers and harbors, amending by substitute H. 18024, for control and regulation of waters of Niagara river [and] preservation of the Falls. June 2, 1906. U. S. 59th Cong., 1st sess. House rep't 4654; serial 4908.) XI

—— Rivers and harbors committee. (House.) Control and regulation of the waters of Niagara river, etc. Report by Mr. Burton from the committee on rivers and harbors to accompany H. J. Res. 262. Feb. 23, 1909. (U. S. 60th Cong., 2d sess. House rep't 2265; serial 5384.) XI

—— Rivers and harbors committee. (House.) Preservation of Niagara Falls. (H. R. 16086 and H. R. 16748.) Hearings . . . (Feb. 17, 1908, and appendix.) Wash.: Gov't print. off. 1908. .XI

—— Rivers and harbors committee. (House.) Preservation of Niagara Falls (H. R. 18024). Hearings (April 12–May 8) before the committee . . . Wash.: Gov't print. off. 1906. (U. S. 59th Cong., 1st sess.) XI

—— Rivers and harbors committee. (House.) Preservation of Niagara Falls. Hearings on the subject of H. R. 26688, Sixty-first Congress, second session, relating to the control and regulation of the waters of Niagara river and the preservation of Niagara Falls, held before the committee on rivers and harbors of the House of Representatives of the United States, 61st Cong., 3d. sess. Wash.: Gov't print. off. 1911. XI

—— Rivers and harbors committee. (House.) Preservation of Niagara Falls. Report by Mr. Burton from the committee on rivers and harbors, favoring H. J. Res. 83, for report upon the preservation of the Falls. Jan. 31, 1906. (U. S. 59th Cong., 1st sess. House rep't 695; serial 4906.) XI

—— War Department. Hearings in the matter of the granting of permits for the transmission from the Dominion of Canada into the United States of power from the Niagara river, before the secretary of war at Washington, D. C. Nov. 26 & 27, 1906. Wash.: Gov't print. off. 1906. X

—— War Department. National park at Niagara Falls. Letter from the secretary of war, submitting, with copy of a report of a special committee, a recommendation for the establishment of a national park at Niagara Falls. Dec. 21, 1909. (U. S. 61st Cong., 2d sess. House doc. 431; serial 5834.) . . . . . .RI

U. S.— War Department . . . Preservation of Niagara Falls. Message from the President . . . transmitting a letter from the secretary of war, submitting additional information concerning the operation of the United States Lake Survey from June 29, 1906, to June 29, 1911. Wash.: Gov. print. off. 1911. (U. S. 63d Cong. 2d sess. House. doc. 246.) XI

—— War Department . . . Preservation of Niagara Falls. Message from the President . . . transmitting a letter from the secretary of war, submitting additional information concerning the operation of the United States Lake Survey from June 29, 1906, to June 29, 1911. Wash.: Gov't print. off. 1911. (U. S. Cong., 2d sess. House doc. 246.)

—— War Department . . . Preservation of Niagara Falls. Message from the President . . . transmitting information relative to scientific investigations made by certain officers of the War Department, for the preservation of Niagara Falls . . . Wash.: Gov't print. off. 1911. (U. S. 62d Cong., 1st sess. Sen. doc. 105.) XI

Unonius, Gustaf. Minnen frán en Sjuttonárig vistelse i Nordvestra Amerika. Andra Upplagan. Upsala: W. Schultz. 1862. Pt. II, pp. 405–412 IV

United States and Canada, as seen by two brothers in 1858 and 1861. Lond.: Edward Stanford. 1862. Pp. 84–89.

Unwin, W. Cawthorne. [Discussion of Prof. Forbes's paper on the Niagara project.] (Jour. soc. arts, Dec. 16, 1892. 41:97–98.)

—— Mechanical energy and industrial progress. (Cass. July, 1895. 8:195–200.) X

—— The Niagara Falls power stations. (Proc. inst. M. E. (Lond.:) 1906. Pp. 135–148.) X

Upham, Warren. The age of Niagara Falls as indicated by the erosion at the mouth of the gorge. (Sci., Oct., 1898. n.s. 8: 502.) VII

—— Geological history of the Great Lakes and Niagara Falls. (Internatl. q., July, 1905. 11:248–265.) VII

—— Niagara as a measure of post-glacial time. (Rec. past, Sept., 1908. 7:244–246.) VII

—— Niagara gorge and St. David's channel. (Geol. Soc. of Am. bulletin. Jan. 25, 1898. 9:101–110.) VII

—— The Niagara gorge as a measure of the post-glacial period. (Am. geol. July, 1894. 14:62–65.) VII

—— Niagara river since the ice age. (Nature, June 28, 1894. 50:198–199.) VII

Upham, Warren. Origin and age of the Laurentian lakes and of Niagara Falls. (Am. geol. Sept., 1896. 18:169–177.) VII

—— The past and future of Niagara Falls. (Ann. rep'ts of the com'rs of the state reserv. at Niagara. Albany: 1903. 19: 229–254.) VII

Urban, Henry. Utilisation des chutes du Niagara. (Societe Belge d'electriciens. Feb., 1907. 24: 33–48.) X

Use of Niagara Falls power (The) — Interesting facts about a great and growing power district. (Elec. rev. May 12, 1897. 30: 217–218.)

Use *vs.* beauty at Niagara. (Lit. dig., Jan. 11, 1913. 46: 71.) XI

Utilization of Niagara. (Eng. news. Nov. 29, 1890. 24: 493.)

Utilization of Niagara (The). (Dub. rev. sci. not. April, 1893. 112: 435.) X

—— I. (Eng. (Lond.), Sept. 26, 1890. 50: 355–258.) X

—— II. (Eng. (Lond.), Oct. 17, 1890. 50: 449–451.) X

—— III. (Eng. (Lond.), Oct. 24, 1890. 50: 473–475.) X

—— (Eng. (Lond.), Dec. 23, 1892. 54: 787.) X

—— VII. (Eng. (Lond.), Jan. 2, 1891. 51: 14, 19–21.) . X and XI

—— VIII. (Eng. (Lond.), Feb. 27, 1891. 51: 235–236.) . . . . . X and XI

—— (Elec. wld., Sept. 24, 1892. 20: 193–194.) X

—— (Am. architect. Sept. 17, 1904. 85: 93–94.)

—— (Sci. Am. sup., Oct. 22, 1904. 58: 24081–24082.)

Utilization of the power of Niagara Falls (The). (Eng. rec., Aug. 8, 1891. 24: 152.)

—— (Eng. rec., Aug. 15, 1891. 24: 174–175.) X

—— (R. R. gaz. July 17, 1891. 23: 501–502.)

—— **and notes on engineering.** (Elec. rev. Aug. 29, 1891. 19: 10–11.)

Utilizing Niagara . . . (Industries of Buffalo. Buffalo: Elstner Pub. Co. 1887. Pp. 66–71.) X

Utilizing Niagara Falls. (Elec. wld., Aug. 10, 1889. 14: 88.) . . X

Utilizing the power of Niagara. (Nation, Aug. 8, 1889. 49: 104–105.) X

Valero, Fernando. Bosqejo de la republica de los Estados Unidos de Norte-America. Escrito en Washington por el C. L. Fernando Valero el año de 1825; i publicado en Guatemala en el de 1830. (Guatemala) Impr. de la Union (1830) Pp. 1–15 III

Van Cleve, A. Howell. Utilization of water power at Niagara Falls. (Bulletin of the Buf. soc. of nat. sci. 8: No. 1.) X

Vandalism at Niagara Falls. (Sci. Am., Apr. 15, 1905. 92: 298.) XI

Vander Aa, Pierre. Canada ou Nouvelle France, suivant les nouvelle observations de Messrs. de l'Academie Royale des Sciences, . . . Augmentées de Nouveau. À Leide: Chez Pierre Vander Aa. (*In* La Galerie agrèable du Monde. Leide: P. Vander Aa. [1729?] Vol. I. Amerique.) IX

—— Nouvelle carte de l'Amerique . . . dressée suivant les plus nouvelles découvertes par les plus habiles géographes, et tout nouvellement mise en lumiere par Pierre Vander Aa. (*In* La Galerie agréable du Monde. Leide: P. Vander Aa. [1729?] Vol. I. Amerique.) . IX

—— L'Amerique selon les Nouvelles observations de Messrs de l'Academie des Sciences. . . . À Leide. Chez Pierre Vander Aa. [I. Georee, delin. J. Baptist sculp.] (*In* La Galerie agréable du Monde. Leide: P. Vander Aa. [1729] Vol. I. Amerique.) IX

—— L'Amérique septentrionale suivant les nouvelles observations de Messrs. l'Academie Royale des Sciences. . . . Augmentées de nouveau. 8¾ x 11¾. À Leide: Chez Pierre Vander Aa. (*In* Hooge, Romein de, Les Indes orientales et occidentales et autres lieux. Leide: Pierre Vander Aa. [1680?] Pl. 9.) IX

Vanderburch, ——. (del.) Voute sons la Chute du Niagara. Boreda por debajo de la Catarata del Niagara. (Grosvenor library, Buffalo, N. Y. Views of Niagara Falls. 1697–187—. Mat 8.) IX

Vanderlyn, John. View of Niagara Falls from the Canadian side. 1804 IX

—— A view of the western branch of the Falls of Niagara, taken from the Table Rock, looking up the river, over the rapids. Engraved by F. C. Lewis. 1802 IX

[Vanderwater, Robert J.] The tourist or pocket manual for travellers. . . . 4th ed. N. Y.: Harper. 1835. Pp. 67–74 XII

Van Duzee, L. D. Niagara. (*In his* By the Atlantic, later poems. Bost.: Lee and Shepard. 1892. Pp. 247–250.) VIII

Van Rensselaer, *Mrs.* Schuyler. Niagara. (Cent., June, 1899. 36:184–202.) IV

—— Niagara. (*In* Stories of the Great Lakes; retold from St. Nicholas. N. Y.: Century. 1907. Pp. 59–71.).

Vanuxem, Lardner. Second annual report of the geological survey of the third district of the state of New York. 1838. P. 271 . . . VII

Variations in the level of the lakes. (Can. jour. Jan., 1854. 2:129.) VII

Vaudricourt, A——. Views of the cataract. 1845–6.....IX

Veduta Generale della Cascata di Niagara. Berniere, inc. (Grosvenor library, Buffalo, N. Y. Views of Niagara Falls. 1697–187—. Mat 5.).....IX

Veduta Generale della Cascata di Niagara. Bernieri, inc. (Grosvenor library, Buffalo, N. Y. Views of Niagara Falls. 1697–187—. Mat 5.).....IX

Vespucius, *pseud.* Geological phaenomena of the Falls of Niagara. (Christian observ., Sept., 1841. 41:530–538.).....VII

—— Geological phaenomena of the Falls of Niagara. (Mus. for. lit., 1841. 43 (n. ser. 15):435–440.).....VII

View of Niagara Falls. (*In* Engleheart, Gardner D., Journal of the progress of H. R. H. the Prince of Wales through British North America; and his visit to the United States, 10th July to 15th November, 1860. Privately printed. 1860. Pp. 63–66.).....IX

View of Niagara as it may be a few years hence (A). (Harp. w., Jan. 13, 1883. 27:32.).....XI

View of the Fall of Niagara. (Grosvenor library, Buffalo, N. Y. Views of Niagara Falls. 1697–187—. Mat 2.)

Views of Niagara Falls and vicinity, 1887. [photographs] n. imp. XII

Views of Niagara Falls, New York. [Columbus, O.: Ward. 1890.]

Vigne, Godfrey T. Six months in America. Lond.: Whittaker, Treacher. 1832. 2:123–134.....III and IX

Visit to Niagara (A). (Lit. liv. age, Nov. 2, 1844. 3:37.)...V

Vivian, Hussey H. Notes of a tour in America, from August 7th to November 17th, 1877. Lond.: Stanford. 1878. Pp. 36–40...IV

Vivian, W——. American Fall from a ravine opposite. Engraved on stone by T. M. Baynes. Published by C. Hullmandel. 183—.IX

——. British or Horseshoe Fall. Engraved on stone by T. M. Baynes. Printed by C. Hullmandel. 183—.....IX

——. Horseshoe Fall from the Canada bank. Engraved on stone by T. M. Baynes. Printed by C. Hullmandel. 183—.....IX

——. Niagara. Engraved on stone by T. M. Baynes. Printed by C. Hullmandel. 183—.....IX

Vivian, W. Side of the American Fall and Horseshoe Fall in the distance. Engraved on stone by T. M. Baynes. Printed by C. Hullmandel. 183— IX

Volney, Constantin Francois Chasseboeuf, *Comte de.* Section of Niagara at the middle of the stream and course of the St. Lawrence at Niagara taken from "Views of the climate and soil of the United States of America" in 1804. (Grosvenor library, Buffalo, N. Y. Views of Niagara Falls. 1697–187—. Mat 6.).....IX

——. A view of the soil and climate of the United States of America. . . . Tr. by C. B. Brown. Phil.: J. Conrad and Co. 1804. Pp. 80–94 VII

Vrooman, Frank. The all-Canadian falls question. (Arena. Sept. 1908. 40:129–136.)

Wakefield, Priscilla. Excursions in North America, described in letters from a gentleman and his young companion, to their friends in England. 3d ed. Lond.: Darton, Harvey and Darton. 1819. Pp. 260–275 VIII

Waldron, Holman D. Niagara Falls in half-tone. Text by Holman D. Waldron. . . . Portland, Me., Chisholm. 1901.....IV

—— With pen and camera at Niagara Falls; text by H. D. Waldron, Portland, Me.: Chisholm. 1898.....V and XI

Wall, ——. Niagara Falls as seen from below. (Grosvenor library, Buffalo, N. Y. Views of Niagara Falls. 1697–187—. Mat 12.) IX

Wallace, Alfred Russell. My life; a record of events and opinions. Lond.: Chapman and Hall. 1905. 2:127–128.....IV

Warburton, George Drought. Hochelaga; or, England in the new world. Lond.: Colburn. 1847. 1:230–244.....XI

Ward, *Mrs.* Humphrey. Marriage à la mode. N. Y.: Doubleday, Page and Co. 1909. Pp. 247–291.....VIII

Ward, James W. To Niagara. Buffalo, N. Y.....VIII

Ward, James W. *ed.* Niagara river and Falls from Lake Erie to Lake Ontario. A series of one hundred fifty-three original etchings. Etched on copper by Ames W. Sangster from his own drawings. Buffalo: Fryer. 1886.

Wardwell, G. T. Gorge of the Niagara; read before the Buffalo field club, Dec. 3, 1880. n. imp.....VII

Warner, Charles Dudley. Their pilgrimage. N. Y.: Harper Brothers. 1897. Pp. 300–315.....VIII

—— Their pilgrimage. Harp. Oct., 1886. 76:677.....VIII

Warner, Susan. The rapids of Niagara. N. Y.: R. Carter and Brothers. 1876. P. 211.....VIII

Warren, H——. Falls of Niagara. Inset to map of West Canada; engraved by Robert Wallis. (*In* Martin, R. M., The British colonies. Lond. and N. Y.: J. F. Tallis. [1829] Div. I.).....IX

Waste of Niagara (The). (Indep., Mar. 16, 1905. 58:618–620.).....X

Water power at Niagara Falls to be successfully utilized. The Niagara river hydraulic tunnel, power and sewer co. Its objects, facilities and resources, inducements for manufacturers, etc. n.d.

Waterpower canal for the Niagara power and development company. (Eng. news, Oct. 4, 1894. 32:272–273.)

Waterton, Charles. Wanderings in South America, the north-west of the United States, and the Antilles, in the years 1812, 1816, 1820, and 1824. Lond.: B. Fellowes. 1828. Pp. 264–269, 278...VI

Waterways treaty; the Burton law, etc. (The). Ann. rep'ts of the com'rs of the state reserv. at Niagara. 26:16–41.....XI

Watson, Winslow C., *editor*. Men and times of the Revolution; or, Memoirs of Elkanah Watson, including journals of travels in Europe and America, from 1777 to 1842. . . . N. Y.: Dana and Co. 1856. Pp. 416–417.....III

Watts, H. F. The Hamilton plan for utilizing Niagara. (Elec. wld., Mar. 2, 1889. 13:133–134.).....X

Waylen, *Rev.* Edward. Ecclesiastical reminiscences of the United States. Lond.: Straker. 1846. Pp. 281–283.....III

Webb, C. H. The cave of the winds. (Harp. mag. Nov. 1867. 35:771–776.)

Weeks, Arthur B. Canadian power development at Niagara Falls. (Elec. rev., June 6, 1903. 41:961.).....X

—— Recent developments at the Niagara Falls power plant. (Sci. Am., Apr. 13, 1901. 84:229.).....X

Weidemeyer, J. W. Niagara. (*In his* Real and ideal; by John W. Montclair. Phila.: Frederick Leypoldt. 1865. Pp. 49–51.)..VIII

Welch, Jane Meade. The neighborhood of the international park. (Harp., Aug., 1887. 75:327–343.).....XII

Welch, Thomas V. How Niagara was made free. The passage of the Niagara reservation act in 1885. (Pub. Buf. hist. soc. 5:325–359.).....XI

—— The state reservation at Niagara. Niagara Falls, N. Y.: 1885.....XI

Weld, Charles Richard. A vacation tour in the United States and Canada. Lond.: Longman, Brown, Green, and Longmans. 1855. Pp. 159–179 XI

Weld, Isaac. An eye sketch of the Falls of Niagara. (*In his* Travels through the states of North America and the provinces of Upper and Lower Canada, during the years 1795, 1796, and 1797. Lond.: Stockdale. 1799. P. 303.) IX

—— Travels through the states of North America, and the provinces of Upper and Lower Canada, during the years 1795, 1796, and 1797. Lond.: Stockdale. 1799. Pp. 308–323 ..... II and XII

—— View of the Horseshoe Fall of Niagara. Neagle, (sc.) Published by I. Stockdale. Picadilly, Dec. 3, 1798 IX

—— View of the Falls of Niagara. Published by I. Stockdale, Picadilly, Dec. 22, 1798 IX

—— View of the lesser fall of Niagara. I. Scott. (sc.) Published by I. Stockdale. Picadilly, Dec. 22, 1798 IX

—— Mariage, (sc.) Vue de la Chute du Fer a Cheval, *also* Ensemble du Saut de la Riviére de Niagara [scarce] *and* Vue de la petite Chute. (Grosvenor library, Buffalo, N. Y. Views of Niagara Falls. 1697–187—. Mat 5.) IX

Weld, Isaac (delt.) View of the Falls of Niagara. Pub. Dec. 22, 1798, by I. Stockdale. Piccadilly. (Grosvenor library, Buffalo, N. Y. Views of Niagara Falls. 1697–187—. Mat 4.) IX

—— Neagle, (sc.) View of the Horse-Shoe Fall of Niagara. Pub. Dec. 5, 1798, by I. Stockdale, Piccadilly. (Grosvenor library, Buffalo, N. Y. Views of Niagara Falls. 1697–187—. Mat 4.) .IX

—— I. Scott, (sc.) View of the Horse-Shoe Fall of Niagara. Lond.: Jones and Co. Sept. 1, 1824. (Grosvenor library, Buffalo, N. Y. Views of Niagara Falls. 1697–187—. Mat 4.) IX

—— I. Scott, (sc.) View of the lesser fall of Niagara. Pub. Dec. 22, 1798, by I. Stockdale, Piccadilly. (Grosvenor library, Buffalo, N. Y. Views of Niagara Falls. 1697–187—. Mat 4.) IX

Wells, H. G. "The end of Niagara." (Harp. w. July 21, 1906. 50: pt. 2. 1018–1020.) X

Wellsteed, J. The Falls of Niagara. (West. lit. mess'gr. July, 1849. 12: 232.) VIII

Wendell, Harvey. Niagara in winter. (Leslie's w. Mar. 24, 1898. 86:186.) VIII

Wentworth, T. H. View in 1820. "XXI." Engraved for Ingraham's "Description of Niagara." IX

Werner, Charles H. The Niagara Falls tunnel. (Cass., June, 1892. 2:73–94.) X

Wesson, Edward. Niagara Falls: the rate at which they recede southwards. (Nature, July 9, 1885. 32:229–230.).....VII

West, John. The substance of a journal during a residence at the Red River Colony, British North America: and frequent excursions among the north west American Indians, in the years 1820, 1821, 1822, 1823. Second edition, enlarged with a journal of a mission to the Indians of New Brunswick, and Nova Scotia, and the Mohawks on the Ouse or Grand river, Upper Canada, 1825, 1826. Lond.: L. B. Seeley and Son. 1827. P. 273.....III

Western New York in 1809. (*In* O'Callaghan, E. B., Documentary history of the state of New York. Albany: 1849. 2:690.) .IX

Western traveller's pocket directory and stranger's guide (The); exhibiting distances on the principal canal routes in the states of New York and Ohio, in the territory of Michigan, and in the province of Lower Canada, etc. Schenectady: S. S. Riggs, Ptr. 1834. Pp. 32–34 XII

Westinghouse generators at Niagara (The). (Power. Nov. 8, 1895. 15:8–9.)

Whetham, J. W. Boddam. (Western wanderings: a record of travel in the evening land. Lond.: Bentley. 1874. Pp. 20–27.).....V and XI

White, Arthur V. The water-powers of Ontario. (*In the* Commission of conservation, Canada, Report on the water-powers of Canada. Ottawa: Mortimer co. 1911. P. 35–100, 113, 354–361.)...XI

White, Eugene R. Niagarics, the new force. (Munsey, Apr., 1903. 29:29–30.) X

White, J. G. The electric power transmission line between Niagara Falls and Buffalo. (St. ry. jour., July, 1897. 13:425–427.)...X

—— The Niagara power transmission line. (Elec. eng., June 16, 1897. 23:674–676.)

White, John. Sketches from America. Lond.: Sampson Low, Son, and Marston. 1870. Pp. 187–199.....IV

Whitman, Walt. November boughs. Phila.: D. McKay. 1888. P. 104 IV

—— Seeing Niagara to advantage. (*In his* Complete prose works. Phila.: David McKay. 1897. Pp. 160–161.).....IV

Wied-Neuwied, Maximilian Alexander Philipp, *Prinz*, von. Reise in das innere Nord-America in den Yahren 1832 bis 1834. Coblenz: 1839. Bei J. Hoelscher. 2: 398–405.....III

—— Travels in the interior of North America, with numerous engravings on wood and a large map; translated by H. Evans Lloyd. Lond.: Ackermann & Co. 1843. Pp. 493–496.....VI

—— Voyage dans l'interieur de l'Amérique du Nord, exécuté pendant les années 1832, 1833 et 1834, par le prince Maximilian de Neuwied. Ouvrage accompagné d'un atlas de 80 planches environ, format demi-colombier, dessinées sur les lieux par M. Charles Bodmer . . . Paris: A. Bertrand. 1840–43. 3: 200–209.....III

Wilkes, George. The fall of Table Rock: by the last man that stood on it. (Lit. liv. age, May 25, 1861. 69: 472.).....V

Wilkie, D. Sketches of a summer trip to New York and the Canadas. Edinb. 1837. Pp. 100–102.....III

Wilkinson, James. Map of the straights of Niagara from Lake Erie to Lake Ontario. 7 x 15. (*In his* Diagrams and plans illustrative of the principal battles and military affairs treated of in "Memoirs of my own times." Phila.: Abraham Small. 1816. No. 15.).....IX

Wilkinson, Florence. Niagara. (Cur. lit., May, 1906. 40: 559–560.).....VIII

—— Niagara. (Outl., Feb. 24, 1906. 82: 432–433.).....VIII

—— Niagara. (Wld's. work, May, 1906. 12: 7479.).....VIII

Willday, George. Map of North America. H. Terasson, delin. et fecit. (1720?).....IX

Williams, Archibald. How it is done, or Victories of the engineer. N. Y.: Nelson. (1908 c) Pp. 467–484.....X

—— The romance of modern engineering. . . . 2d ed. Phila.: Lippincott; Lond.: Pearson. 1904. Pp. 11–33.....X

—— The wonders of modern engineering. . . . Phila.: Lippincott. Lond.: Seeley, Service. 1912. Pp. 11–33.....X

Williams, C. T. [Letter on the preservation of Niagara Falls.] (Sci. Am., June 24, 1911. 104: 619.).....XI

Williams, Edward T. Niagara in romance and commerce. (Harp. w., June 14, 1913. 57: pt. 1, 29.).....X

—— Niagara Falls and the electrical age. Niagara Falls, N. Y.: 1914.

Williams, Edward T. Niagara, queen of wonders; a history of the big events in three centuries along the Niagara frontier. . . . Bost.: Chapple Pub. Co. 1916.

—— The power of Niagara Falls. (Niagara Falls, N. Y. Industrial commission.) [Niagara Falls: Courier press. 1911?]

—— Using Niagara's power. (Harp. w., June 14, 1913. 57: pt. 1, 28.) X

Williams, Espy. Niagara. (*In his* Dream of art, and other poems. N. Y.: Putnam. 1892. P. 70.) VIII

Williams, J. David, *ed.* America illustrated. N. Y.: The Arundel Print. n.d. Pp. 37–41 V

Williams, W. G. Report of a survey around the Falls of Niagara with a view to the construction of a ship canal, made during the year 1835. (H. R. doc. 214, 24th Cong., 1st sess.) XII

Williamson, Charles. The Falls of Niagara. 1799. (Mag. of Am. hist. July, 1880. 5: 54–56; *or* O'Callaghan, E. B., Doc. hist. of the state of New York. Albany: Weed, Parsons and Co. 1849. 2: 1165–1167.) XII

Williamson, Peter. The travels of Peter Williamson, among the different nations and tribes of savage Indians in America . . . likewise, an accurate description of the Falls of Niagara . . . Edinb.: Printed for the author, 1763. Pp. 28–37 II

Willis, Bailey. Changes in the recession of the Falls of Niagara. (Science n.s. Sept. 18, 1908. 28: 381–384.) VII

Willis, Nathaniel Parker. Inklings of adventure. N. Y.: Saunders and Otley. 1836. 1: 25–36 III

—— American scenery. Lond.: 1840. See index III

[Wilson, Alexander.] The foresters; a poem, descriptive of a pedestrian journey to the Falls of Niagara, in the autumn of 1803. By the author of the *American Ornithology*. (The Portfolio. March, 1810. 3: 182–187.) VIII

—— The foresters; a poem, descriptive of a pedestrian journey to the Falls of Niagara, in the autumn of 1804, by the author of the *American ornithology*. Pub. by Samuel Tomlinson, Bucks County, Pa. Phila.: John Boyle. 1853. Pp. 71–78 VIII

—— General view of the Falls of Niagara. (Grosvenor library, Buffalo, N. Y. Views of Niagara Falls. 1697–187—. Mat 7.) IX

—— View of the great pitch taken from below *and* General view of the Falls of Niagara, eng. by George Cooke. (Portfolio, March, 1810. 3: No. 3, 182–187.) IX

Wilson, Alexander *and* Bonaparte, Charles Lucien. American ornithology; or the natural history of the birds of the United States. Ed. by Robert Jameson. 4 vol. Edinb.: Constable and Co. 1831. 1:23 VI

Wilson, Robert. Niagara Falls — Horseshoe. 15 x 21. Eng. by William Byrne. 1768 IX

Wilson, Thomas. Transatlantic sketches; or, Traveling reminiscences of the West Indies and United States. Montreal: John Lovell. 1860. Pp. 174–179 IV

Winchell, Alexander. Walks and talks in the geological field. N. Y.: Chaut. Press. 1886. P. 43 VII

Winckelmann, —— *and* Schue ——. Aussicht auf den Niagara Fall. (Grosvenor library, Buffalo, N. Y. Views of Niagara Falls. 1697–187—. Mat 17.) IX

Wines, Mary J. Niagara Falls. (*In her* Infant harper and other poems. Cambridge, Mass.: Hurd & Houghton. 1874. P. 193.) . VIII

Winter scenery for Niagara roads. (St. ry. rev. Feb. 15, 1896. 6:94.)

Winterbotham, W. An historical, geographical, commercial and philosophical view of the United States of America, and of the European settlements in America and the West Indies. The first American edition, with additions and corrections. New York: Tiebout and O'Brien for Thomas Stephens. 1796. 1:183–184 V

Wise decision (A). (Outl., Feb. 2, 1907. 85:236.) XI

Withrow, William H. Our own country. Canada scenic and descriptive. . . . Toronto. Wm. Briggs. 1889. Pp. 317–341 . . IV

Witteman, Adolph. New bond paper map of Niagara Falls and vicinity. 7½ x 13. N. Y.: A. Witteman. 1886 IX

Witmer, Tobias. Map of the town of Niagara. Drawn from surveys and authentic records by Tobias Witmer, surveyor, 1854. 24 x 50. Buffalo, N. Y.: Lith. by W. Berggoetz. [1854.] IX

Wonders of Canada (The). A letter from a gentleman to the Antigua Gazette, New York, August 21, 1768. (Mag. Am. hist., April, 1877. Vol. 1, pt. I, 243–246.) II

Wood, De Volson. Five thousand horse power turbines at Niagara Falls. (Jour. w. soc. eng., Jan., 1897. 2:92–99.)

—— A turbine of the Niagara power company. (Am. mach., Jan. 23, 1896. 19:106–107.) X

Wood, Eugene. Niagara. (McClure, Sept., 1906. 27:475–490.) V

Wood, M. Elva. Songs of the noon and night. N. Y. 1866. P. 44 VIII
Woodbridge, J. E. The development and extension of the Niagara power system up to date. (Am. elect., Jan., 1900. 12:1–20.) ..X
—— The Niagara Falls power plant. (Elec. wld., Jan. 7, 1899. 33: 3–13.) X
—— Power developments at Niagara. (Eng. mag., Feb., 1900. 18:776–777.)
Woodbridge, William C. Rudiments of geography on a new plan. . . . 11th ed. Hartford: Cooke. 1829. P. 62.....V
Woodman, Charles C. Argument in favor of a marine railway around the Falls of Niagara, addressed to the committee on military affairs of the senate of the United States. February, 1865.....XII
Woods, Nicholas A. The Prince of Wales in Canada and the United States. Lond.: Bradbury & Evans. 1861. Pp. 235–252 IV
Woodward, Robert Simpson. List of co-ordinates used and determined in a survey of Niagara Falls, made in . . . 1886 for the United States geological survey. (Ann. rep'ts of the com'rs of the state reserv. at Niagara. Albany: 1891. 7:103–116.).....VII
—— On the rate of recession of Niagara Falls. (Am. jour. of sci. 1886. 28: 383–384.).....VII
—— On the rate of recession of Niagara Falls as shown by the results of a recent survey. [Abstract] (Proc. A. A. A. S. Aug., 1886. 35: 222–223.) VII
—— On the rate of recession of Niagara Falls. (Sci. Sept. 3, 1886. 8: 205.) VII
Worcester, James. Cataract of Niagara. (Literary souvenir; a weekly journal of literature, science and the arts. Lowell. June 19, 1841. 3:185–186.).....IV
Work of the Tonawanda power company (The). (Am. elec. April 1900. 12:155–163.)
Works of the Ontario power company (The) — I. (Eng. rec., Oct. 8, 1904. 50: 420–422.).....X
—— II (Eng. rec., Oct. 15, 1904. 50: 460–462.).....X
—— III. (Eng. rec., Oct. 22, 1904. 50: 480–482.).....X
—— IV. (Eng. rec., Oct. 29, 1904. 50: 504–505.).....X
Wrestle with Niagara (A). (Every Sat., Aug. 12, 1871. 11: 167.) V
—— (Lit. liv. age, Aug. 19, 1871. 110: 509–511.).....V

Wright, Frances. Views of society and manners in America; in a series of letters from that country to a friend in England, during the years 1818, 1819 and 1820. Lond.: Longman, Hurst, Rees, Orme and Brown. 1821. Pp. 237–246; *also* N. Y.: E. Bliss and E. White. 1821. Pp. 173–180.....XII

Wright, George Frederick. The age of Niagara Falls as indicated by the erosion at the mouth of the gorge. (Sci., Oct. 14, 1898. 8: 502.) VII

—— Chronology of the glacial epoch in North America. (Geol. Soc. of London. Quarterly jour. 1908. 64:149–151.) [Abstract] .VII

—— Extract from Man and the glacial period. (Ann. rep'ts of the com'rs of the state reserv. at Niagara. Albany. 1893. Pp. 84–87.) VII

—— The ice age in North America and its bearings upon the antiquity of man. 5th ed. Oberlin: Bibliotheca Sacra. 1911. P. 532–552 VII

—— A new method of estimating the age of Niagara Falls. (Pop. sci. mo., June 1899. 55:145–154.).....VII

—— The Niagara gorge as a chronometer. (Bibliotheca Sacra., Apr., 1884. 41: 369–376.).....VII

—— Niagara gorge as a chronometer. (Sci., May 15, 1885. 5: 399–401.) VII

—— The Niagara river and the glacial period. (Am. jour. sci., July, 1884. 128 (ser. 3, 28): 32–35.....VII

—— The rate of lateral erosion at Niagara. (Am. geol., March, 1902. 29:140–143.) VII

Wyatt, Edith. Niagara. (Lit. dig. Sept. 27, 1913. 47: 544.) VIII

Wyld, James. Sketch of the Niagara river. 11 x 7. Lond.: J. Wyld. 1838 IX

Wyse, Francis. America, its resources. . . . Lond.: T. C. Newby. 1846. Vol. III. Pp. 179–183.

Yeigh, Frank. The Queen Victoria Niagara Falls park. (Can. mag., Oct., 1912. 39: 541.).....XI

Young, David. Historical facts and thrilling incidents of the Niagara frontier. Niagara Falls, N. Y.: (1895).....VIII

[Young, David.] The humbugs of Niagara Falls exposed. With a complete tourists' guide, giving hints that will enable the visitors to avoid imposition. Suspension Bridge, N. Y.: [1884].....V

Young, *Mrs.* Julia Ditto. Adrift: a story of Niagara. Phila.: Lippincott. 1889.....VIII

Young, *Rev.* W. Montgomery. Rushing waters and deep sea pearls. 2d ed. Buffalo. Ulbrich. 1908.....VIII

Zangwill, Israel. Noah's ark. (*In his* They that walk in darkness. N. Y.: Macmillan Co. 1899.).....VIII

Zaremba, Edward. Niagara captive; a poem. (Metal. & chem. eng. Mar., 1913. 11:120.).....VIII

Zavala, Lorenzo de. Viage á los Estados-Unidos del Norte de América. Paris: de Decourchant. 1834. Pp. 97–98.....III

Zincke, F. Barham. Last winter in the United States, being table talk collected during a tour through the late Southern Confederation, the far west, the Rocky mountains. . . . Lond.: John Murray. 1868. Pp. 263–268.....IV